THE IRON AGE

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Workmen's Co-operation Reduces Accidents

Results of the Burroughs Adding Machine Company's Educational Campaign—Interesting Safety Devices Used in Plant

Sheet Metal Guard Intended to Prevent the Elevator Controller Lever from Being Thrown to the Operating Position by Trucks or Passengers Crowding against It and the Lock to Guard against Unauthorized Movements of the Car

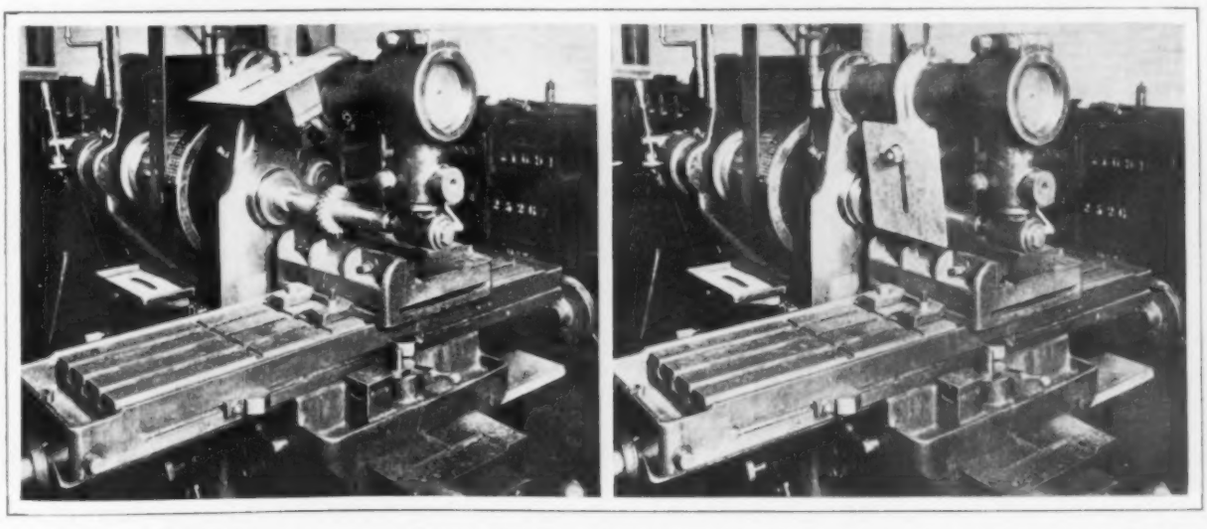
WHAT one large employer of labor has accomplished in reducing the number of accidents in its plant, through a well conducted accident prevention campaign along educational lines with a view of securing the co-operation of its foremen and the interest of its workmen, is found in the comparative record of accidents in the works of the Burroughs Adding Machine Company, Detroit, Mich., in 1913 and 1914. The plan under which the work was and is still being conducted is of much interest, and its results are shown by the fact that actual time loss from all accidents as well as the hours lost per 100 men per month was reduced about 60 per cent., and the cost of workmen's compensation per $100 of payroll was cut down in a greater proportion.

A comparative record of the company's accidents in the years 1913 and 1914 is given in the accompanying table.

Comparative Record of Accidents for Years 1913-1914

	1913	1914
Hours lost from all accidents.....	8,684	3,415
Hours lost per 100 men per month.	33.3	13.2
Cost of compensation per $100 of payroll	$0.369	$0.086

The safety work of this company up to the latter part of 1913 was limited for the most part to the installation of guards for machinery and various other safety devices. This safety work was under the charge of one or two men. The plant was well equipped with safety appliances, but the results as shown by the accident reports were not regarded as satisfactory. All safety guards that were considered necessary were provided, but practically nothing in the way of educating the men in avoiding accidents had been attempted. The company came to the conclusion that while safety appliances and danger signals tend to reduce factory accidents greatly, they do not in themselves cut the accidents down to a minimum, and that to bring the work of a plant along safety lines to its highest point of efficiency there must be a well formulated plan of educational work conducted among the workmen, as well as the installation of mechanical safety guards, and that the co-operation of the men and foremen is essential. Other companies have reached practically similar conclusions after the installation of safety-first devices have not caused the elimination of as many injuries as had been expected, and



The Guard for the Cutter on a Universal Milling Machine Raised to Give the Operator Access to the Cutter and Lowered to Protect Him when the Machine Is in Use

have adopted educational campaigns of various forms along safety lines, but probably a greater percentage think that they have gone far enough in safety work for their own interests and the welfare of their employees when they have installed such safety devices as danger spots warranted or the laws of the state required.

SECURING CO-OPERATION OF EMPLOYEES

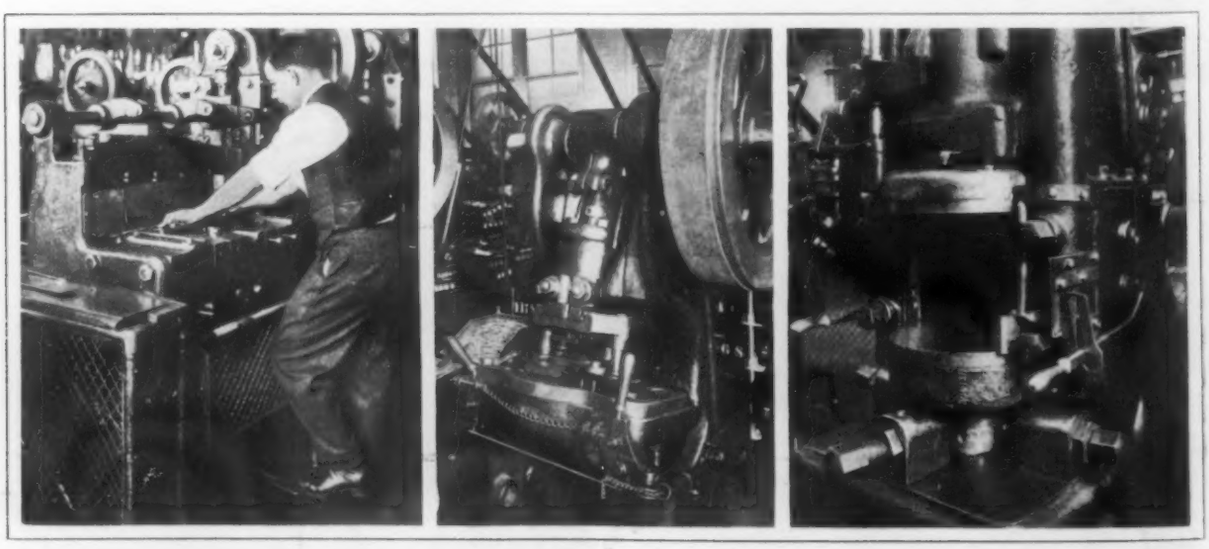
The first step in the starting of the company's safety work was the formation of a central standing safety committee composed of the construction engineer, assistant to the works production manager, and an assistant in the maintenance division. Under this committee is a sub-committee of three workmen in each of the three manufacturing departments or divisions. The members of these sub-committees are appointed by the foremen of the departments, and each serves only for one month. The plan of having sub-committees and changing their membership frequently was adopted to arouse the interest and co-operation of the men, and the foremen's part in naming the sub-committees was expected to have a similar effect on the foremen. It was believed that after an employee had served on a sub-committee a month he would continue to take an interest in safety work after he had retired from the committee. Experience of over a year in this system has demonstrated, in the opinion of the company, the accuracy of this conclusion, as workmen who have served on the committees for the most part keep up their interest in safety work after other employees have taken their places on the several different committees.

The members of the sub-committees meet once a week with the factory inspector, holding a session of one hour, during which proposed changes along safety lines are considered and parts of the plant are inspected. The interest of the employees has been aroused to such an extent that a large number of suggestions for changes to prevent accidents come from them. No award for suggestions adopted are made, as in some plants, but the men seem to be as free to make suggestions as they would be had they hope of reward. The sub-committees act on suggestions made and, if approved, recommend their adoption to the standing central committee. The latter takes up the recommendations of the sub-committees, and a large percentage of these are regarded as meritorious and are adopted. Sometimes a recommendation is adopted, not because it is regarded as sufficiently valuable, but to encourage the men in their safety-first work. In its experience in accident prevention work the company has developed a number of principles or actions which may be summarized very briefly as follows:

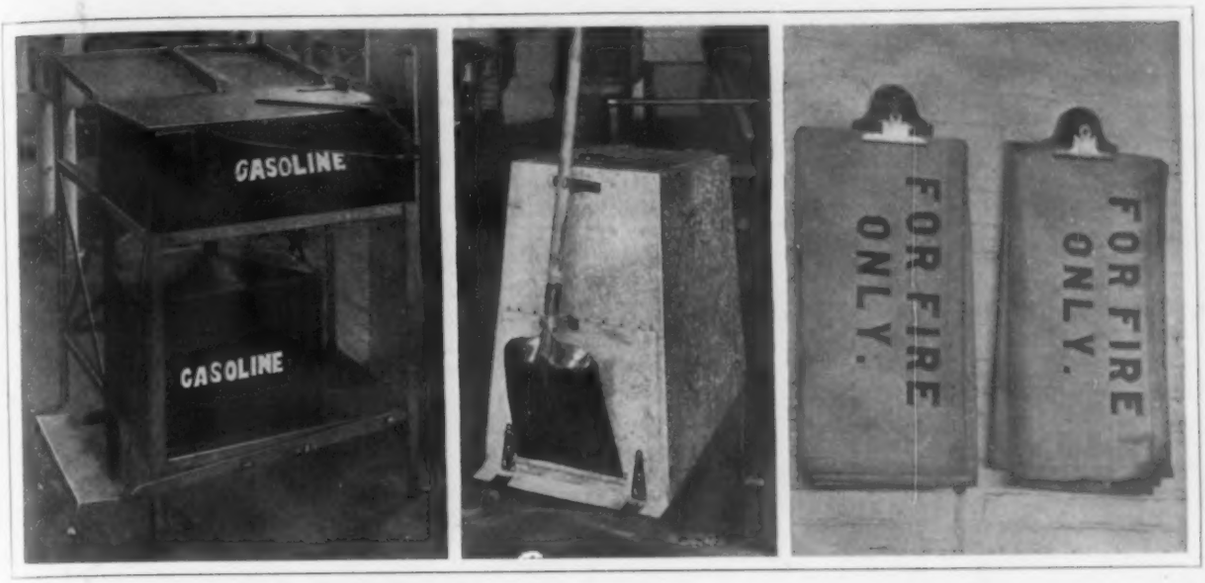
The first essential in safety work is getting the co-operation of the foremen. One has nothing to start with without this co-operation. The co-operation of the foremen is necessary in order to secure the co-operation of the workmen. Unless the interest of the workmen is aroused and their co-operation is assured it will be hard to get them to use safety devices. Safety work must be kept up. If it is developed to a high point in a plant and then neglected it will fall back from the high peak of efficiency and in time conditions will be only a little better than they were before the beginning of the safety movement.

After the company inaugurated its safety work it found that there were numerous instances where workmen did not want to use safety equipment. To overcome this antagonism or indifference to safety devices a campaign was started to secure the co-operation of the foremen. This campaign continued for a week and included noonday and evening meetings that were addressed by speakers well informed on accident prevention and on safety topics, and during some of these meetings moving pictures and lantern slides were shown. All the employees had an opportunity to attend part of the meetings and many accepted invitations to bring their families to the evening meetings. While attendance at any of the meetings was not compulsory, they were well attended and the desired interest was aroused. Safety first bulletins were distributed among the foremen and members of the various sub-committees.

Following the educational campaign of a week, the company's work along safety lines is being continued in various ways, including the publication in the monthly issue of the company's house organ, "The Burroughs," which goes to every plant employee, of articles and items of interest regarding safety-first work, photographs of safety appliances and stories as to how accidents had happened and how they could have been avoided and suggestions received from employees. The following, as examples, are taken from those received in one month and published in the house organ. The action taken on the suggestions is noted in brackets:



A Guard for a Squaring Sheet Shearing Machine Where It Is Necessary for the Operator to Place His Hands near the Cutter and the Wire Mesh Guards around the Lower Portion, a Two-Hand Tripping Device Requiring Both Hands to be on the Levers before the Press Can Be Tripped and a Drop Hammer Having a Cam-Operated Safety Block



Three Views Showing What Is Being Done along Fire Prevention Lines. From Left to Right These Are a Safety Gasoline Tank, a Sawdust Box and Fire Smothering Blankets. The First Is Used for Cleaning Pieces in Departments not Accessible to the Cleaning Room and Is Operated by the Foot Treadle Which Controls the Raising of the Lid through a Cable. The Sawdust Box Is a Recent Addition to the Company's Fire Fighting Apparatus and Contains a Mixture of Sawdust and Sodium Bicarbonate for Extinguishing Japan and Gasoline Fires. The Canvas Fire Smothering Blankets Are Mounted in Quickly Detachable Holders on the Walls in Departments where Inflammable Materials Are Used

That all hooks on doors be located above the hight of a man's head. Hooks as now located are apt to cause an injury. [Hooks have been raised as suggested.]

That the sharp points of all door latches be cut off. Their points are much longer than necessary and are dangerous. [This has been done.]

That drip cups be made and attached to the line-shaft hangers. [Inspection Division Committee is designing a cup to be submitted as a sample.]

A paragraph in an article on the safety movement and the reduction in the number of accidents in another issue of the house organ reads as follows:

It is gratifying to note that the greatest decrease is in amputations, which are our most serious cases. While a part of this decrease is probably due to the installation of safety equipment and factory inspection, the greater part of it is undoubtedly due to the hearty co-operation and enthusiastic efforts of our employees in adopting safety methods. Our employees have come to realize that accident prevention is a distinct advantage to themselves, for while they are paid half pay for time lost through accidents there is no way in which they may be remunerated for the other half of their time or the pain and suffering incident to accidents.

The bulk of the safety work is under direct supervision of the factory inspector, who inspects the safety devices to see that they are properly installed and maintained, and he makes various regular and systematic inspections that are not provided for under the state laws or covered under other inspections. The inspector makes a weekly inspection of all parts of the plant, his work including an inspection of the fire apparatus and plant conditions with a view to making any changes that may be desired to reduce the fire hazards.

In addition to its plant hospital, the company maintains a number of first-aid hospital substations in the tool cribs where various first-aid equipment is kept for attending to minor injuries. Shop men are not disposed to go some distance to a plant hospital when they suffer a trivial injury, but with the substations they can have injuries of this character attended to with little loss of time.

Because of the character of the work, the most serious accidents at the plant before the accident prevention movement started were the crushing of fingers in punch presses, necessitating amputation. These accidents have been practically eliminated. What is regarded as the most important accident prevention device in use is a hand tripping device for punch presses. When this device was first put on the punch presses the number of accidents from these machines showed little, if any, reduction, which fact the company believes proves that safety devices in themselves do not accomplish much unless the interest of the workmen has been aroused in accident prevention. When the interest of the men was secured by the safety campaign, accidents on punch presses were reduced 75 per cent. After the hand tripping device was put in use, quite a number of accidents were caused by a weakening of the spring. To eliminate this danger a standard tension for these springs was adopted, and these springs are now tested every week by the factory inspector. During the last eight or nine months there have been no accidents on punch presses serious enough to necessitate amputation. Previous to that accidents on these machines necessitated about a dozen amputations a year.

The two-hand tripping device is shown in one of the accompanying illustrations. The chain operating the tripping mechanism is detached from the foot lever and attached to the right lever. The left lever operates the locking device on the right lever, and it is necessary for the operator to have both hands on the levers to trip the machine. The operating chains are protected by passing them through an iron pipe.

In another illustration is shown a safety attachment designed in the plant for a 200-lb. drop hammer. This device is a block swinging on a shaft and an operating cam connecting the block to the right tripping lever. The hand lever and safety latch are regular equipment for the machine. The safety block remains in position beneath the hammer at all times except when the right lever is raised. The operating cam is timed so that it is impossible for the safety block to return to position before the hammer has descended, but returns to its position immediately when the right lever is raised. The principal value of this safety block is to protect the operator from danger of injury should either of the operating belts break during the up stroke of the hammer.

Two photographs illustrate a universal milling

machine cutter guard, one showing the guard in place and the other showing how it can be raised to give the operator access to the cutter. The guard is so constructed that it can be readily adjusted to suit the diameter of cutters and shape of work, or reversed according to the direction of rotation of the spindle.

One photograph shows a well guarded squaring sheet shearing machine that is being used for a special operation where it is necessary for the operator to place his hands close to the cutter. For this operation the hold-down has been removed and a special thin sheet metal guard is placed so that the operator cannot get his hands in contact with the cutter. As the photograph shows, the guard for the gears on the left reaches to the floor. There is a guard for the pulleys and belt at the right and the front is adequately guarded so that the operator's apron cannot become caught in the revolving shaft.

In another photograph is shown the method of guarding and locking an elevator controlling lever. The sheet metal guard is intended to prevent the lever from being thrown to the working position by trucks or passengers crowding against it. The padlock is for the purpose of locking the controlling lever in the neutral position, preventing the elevator from being used by other than the regular operator. This lock is also of service in making repairs to elevators. The workman making repairs locks the controlling lever and keeps possession of the key until the repairs are completed.

FIRE PREVENTION DEVICES

Several interesting devices are used along fire prevention lines. One photograph shows a safety gasoline tank for cleaning parts in departments not accessible to the cleaning room. In using this tank the operator steps on a foot treadle, shown in front of the machine, opening the lid of the tank by the cable shown in the photograph. A drain board is provided on which to place the work that has been cleaned and which permits gasoline to drain back into the tank. The cover remains open only as long as the operator keeps his weight on the foot treadle. The purpose of the gasoline reservoir shown beneath the cleaning tank is to provide a safe means of removing gasoline or securing new supplies. A drain cock, not visible in the photograph, is provided in the cleaning tank so that gasoline can be readily drained. The apparatus is built entirely of metal and removes all danger of fire except for the short interval during the cleaning operation.

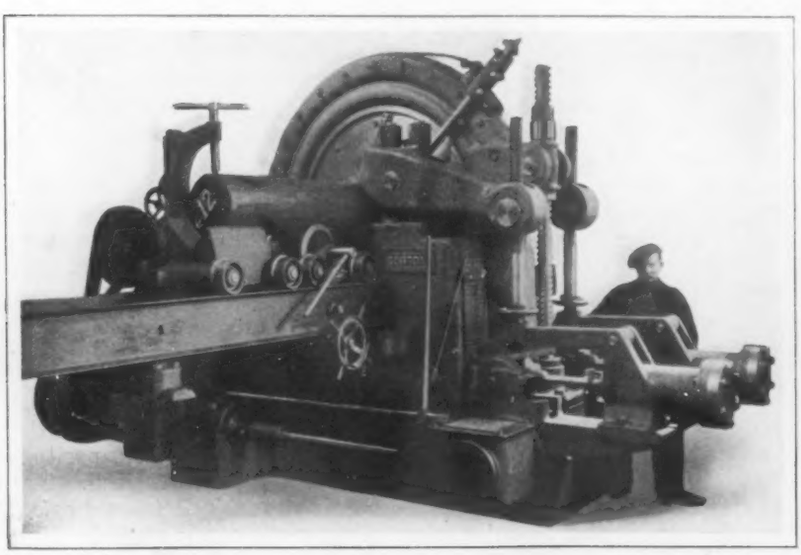
Another photograph shows another recent addition to the company's fire fighting apparatus. This is a sawdust box in which is kept a mixture of sawdust and sodium bicarbonate, which in a series of tests was found to be quite effective in extinguishing japan fires and can sometimes be used to advantage in extinguishing gasoline fires. The shovel used in handling the sawdust is held in place on the sheet metal box by a spring clamp. When the shovel is removed the door automatically opens and the contents can be quickly shoveled out and used to extinguish the flames. Another addition to the company's fire fighting apparatus are canvas smothering blankets, with quick detachable holders. These blankets are conveniently located in departments where inflammable materials are used.

HEAVY CUTTING-OFF MACHINE

Novel Arrangement of Cutter Tools for High-Speed Work on Projectile Stock

The machine, three views of which are shown in the accompanying illustrations, is designed for cutting off heavy bar stock such as projectile material, axles or other heavy forgings. In one engraving it is shown cutting off 12¼-in. round, nickel-steel, armor-piercing projectile stock, and on this piece, which is the maximum diameter the machine will handle, eight lengths were cut off per hour, running continuously. Cutting a 7½-in. round of extra mild steel, where the steel was of such toughness as to require the use of a chip breaker, the bar was severed in 14½ sec., or at a rate equivalent to 15 in. per min., which is in excess of the duty up to which high-speed steel cutters will stand in continuous cutting. It is possible, however, to sever 7½-in. round, steel bars, having a carbon content of from 0.30 to 0.40 per cent., at the rate of a cut per minute under normal working conditions. The machine will cut bars down to 3 in., but where the diameter is less than 5 in. the higher speeds of which the machine is capable cannot be employed because of the absence of stiffness in the material.

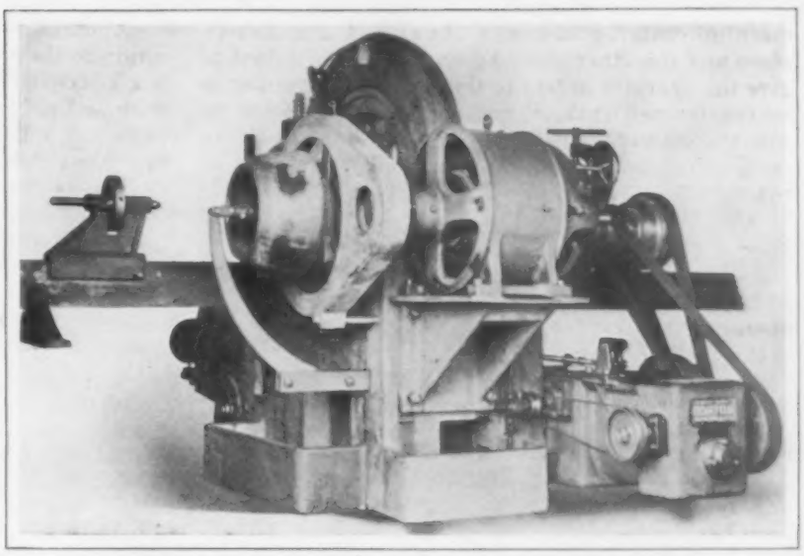
The machine base is a one-piece casting weighing 18,000 lb. Mounted centrally on this base is a swinging head carrying the cutter blade, fitted with ten cutters, which are shown in the view of the cutter drum. On either side of the cutter head the base provides a fulcrum support for a powerful clamping lever, operated from air, steam or hydraulic cylinders, through a cross-head sliding in ways, the upper of which is tapered and pivoted so as to be raised by the cross-head. Each of these clamping levers weighs 800 lb., and with a cylinder pressure as high as 1000 lb. available, the gripping power of the levers equivalent to 150,000 lb., is apparent. The lever on the discharge side of the cutter is required only where a final short end is to be cut. The machine base also carries one end of a trolley from 22 to 23 ft. long, on which is mounted a carriage for supporting the stock to be cut and carrying it in to the cutters as the work progresses



General Front View of the Machine Cutting Off Round Projectile Stock 12 In. in Diameter

The illustration of the cutter

blade with the inserted cutters and thrust blocks also shows the semi-steel gear band, through which the cutter is driven. This gear is 70 in. in diameter and 5 in. across the face, and into it the driving pinion meshes directly. This driving pinion is thrown into gear with the direct-connected motor drive by a clutch controlled by a lever at the front of the machine, the clutch being provided with a shearing pin for the disconnection of all heavy rotating parts from the cutter drum in event of accident. In the rear view of the machine, the driving clutch is shown in the foreground, and at the opposite end of the motor shaft, the driving cone for the feed gearing, which is inclosed in the case below and runs in oil, is located.



Rear View Showing the Driving Clutch and the Feed Mechanism

The design of the cutter of this machine with its drive at the periphery of the blade and the cutting tools at the center, it is pointed out, makes for a minimum of vibration with the attendant advantages in high-speed cutting. As an added precaution in connection with the powerful drive forcing

Detail View of the Cutter Blade and Cutting Tools

the cutters through the metal, the cutting tools are inserted in the blade with a thrust block between each cutter. These thrust blocks are arranged so as to make a continuous ring through which pressure on any one tool is transmitted to all 10 of the pockets in which the cutter tools are inserted. This design is apparent from the view of the cutter blade. The device also serves to protect the cutter blade from excessive strain, tests having demonstrated that the cutting tool will be sheared off before any damage is done to the blade. An automatic chip breaker, also supplied with the machine, removes, from the points of the tools, the chips that adhere when a particularly tough piece of steel is being cut. A water system for spraying the tools to keep them cool includes a pump and drainage chambers for the disposal of the water. A special grinding machine is also supplied for sharpening the cutting tools, it being accurately adjustable for the proper shaping of the cutting edge. In this way it is possible to take down a dull set of cutters, sharpen them and have the cutter in operation again within a period of approximately 20 min.

This machine has a width of 8 ft., length of 15 ft. and hight of 9½ ft. It weighs 55,000 lb. and is built by the George Gorton Machine Company, Racine, Wis.

American Iron and Steel Institute Programme

The eighth general meeting of the American Iron and Steel Institute, to be held at the Waldorf-Astoria, New York, May 28, will be opened with an address by the president, Elbert H. Gary. Papers will be read as follows:

"Waste Heat Boilers," by Charles J. Bacon, steam engineer, Illinois Steel Company, South Chicago, Ill.

"The Commercial Production of Sound and Homogeneous Steel," by Edward F. Kenney, metallurgical engineer, Cambria Steel Company, Johnstown, Pa.

"Blast Furnace Advancement," by Andrew E. Maccoun, superintendent, Edgar Thomson blast furnaces, Carnegie Steel Company, Braddock, Pa.

"Merchant Rolling Mills," by Jerome R. George, chief engineer, Morgan Construction Company, Worcester, Mass.

"Recent Progress in Corrosion Resistance," by Daniel M. Buck, metallurgical engineer, American Sheet & Tin Plate Company, Pittsburgh, Pa.

At the banquet in the evening the principal paper will be on "Welfare Work of the Tennessee Coal, Iron & Railroad Company."

It will be noted that there are fewer formal papers than usual, and that no formal discussion has been provided for on the programme. It is hoped and expected, however, that there will be considerable informal discussion. A hearty invitation to participate in this discussion is extended to members.

German Steel Works Union's March Output

The shipments of the German Steel Works Union in March, 1915, were the best since the war's outbreak —351,560 tons, compared with 560,527 tons in March, 1914, and 266,905 tons in February, 1915. This is 84,655 tons more than in February of this year and 208,667 tons less than in March a year ago. Of the total March shipments this year, semi-finished steel constituted 86,865 tons (153,170 tons in March, 1914); railroad material, 160,435 tons (206,325 tons a year ago), and shapes, 104,260 tons (201,033 tons a year ago). The shipments of shapes in March are double those of January, indicating a substantial increase in building activity.

All the material for the construction of the new blast furnace of the Robesonia Iron Company, Ltd., Robesonia, Pa., is on the ground and the erection will commence as soon as the old furnace is removed. Frank C. Roberts & Co., Philadelphia, are the designing and supervising engineers.

SELF-CONTAINED POWER PLANT

A 400-Hp. Unit Combining a Boiler, Engine and Various Auxiliaries on One Base

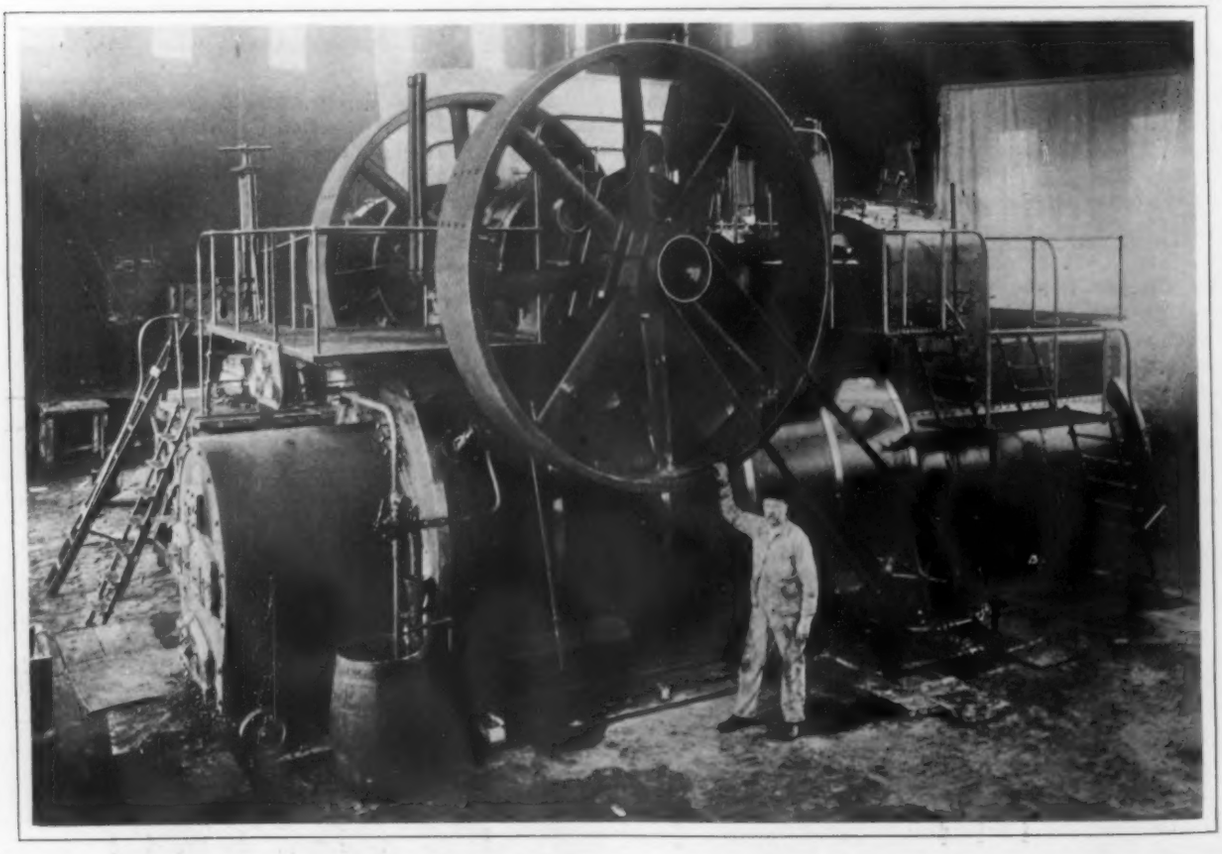
Combined steam engines and boiler plants designed for the utilization of high-pressure superheated steam, known as the Locomobile, have been built in Germany for the past 15 years and are now extensively in use in the European countries and their dependencies. These are claimed to represent the logical development of the portable steam boiler and engine plant in a country where fuel economy is urgent, and that they have not been introduced into the United States until recently is attributed to the relative cheapness of fuel in this country. The Buckeye Engine Company, Salem, Ohio, recently began the building of power units of this type to which it has given the trade name Buckeye-mobile, and one of these, a 400-hp. unit, is shown in the accompanying illustration. This unit differs from the conventional power plant chiefly in the fact that by combining into a single assembly a high-pressure boiler, primary and secondary superheaters, a compound steam engine, a feed water heater and a condenser, a low fuel consumption is obtained that is claimed not to have been possible heretofore in steam plants of small or medium capacity.

This unit, in ordinary, every-day operation, is said to consume about 1½ lb. of coal per i. hp, corresponding to about 2½ lb. per kw.-hr. The coal consumption in the majority of steam plants or less than 400 or 500 hp. is said to be 4 to 6 lb. per hp. per hr. The economy in operation of this type of plant is made possible through the use of high-pressure superheated steam and the elimination of the heat losses incidental to the usual type of steam plant where the engines, boiler and auxiliary are connected by long lines of piping.

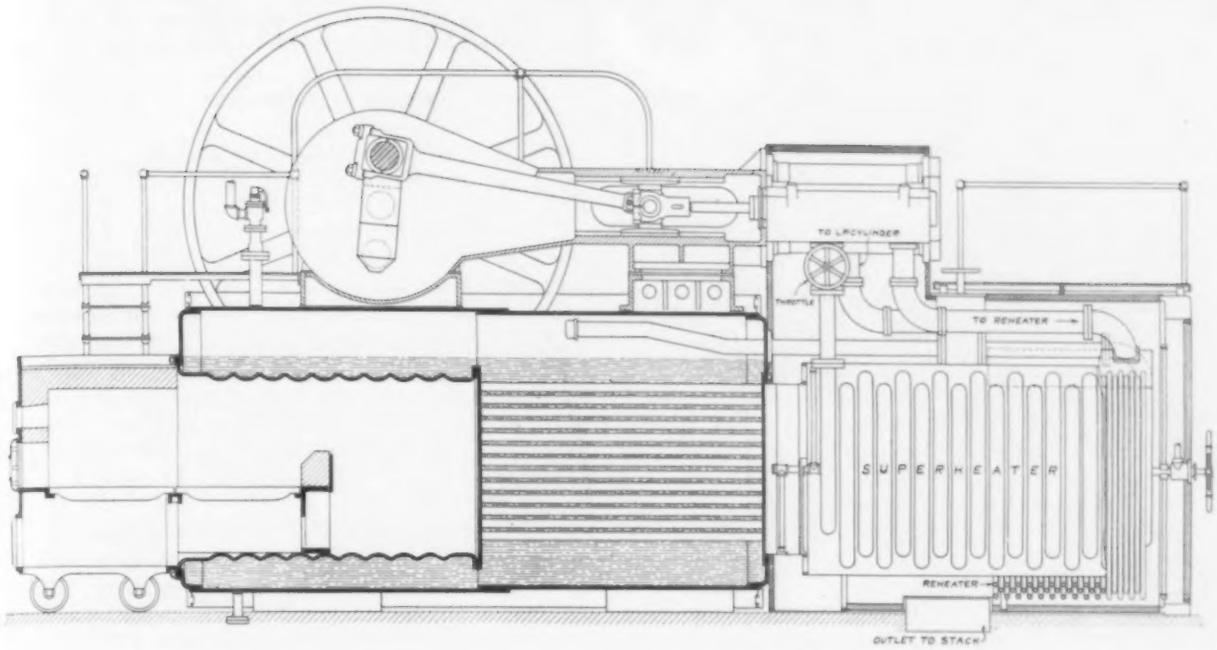
When ordinary saturated steam is used in an engine, a considerable portion, on entering the cylinder, is condensed, thus losing all ability to do work. The Locomobile type of engine is said to produce a horsepower on about 10 lb. of steam, as compared with from 25 to 50 lb. required on a simple, non-condensing engine and from 16 to 20 lb. required by the compound condensing engine, with a corresponding reduction in fuel consumption. The amount of fuel required to raise the steam pressure from the usual 125 or 150 lb. to 225 lb., and to heat it to 250 deg. is quite small, owing to the location of the superheater and the reheater in the path of the flue gases leaving the boiler tubes.

The unit illustrated consists of a cross-compound steam engine, mounted on an internally fired high-pressure boiler of the non-return or gunboat type. Inclosed in a well insulated sheet metal smoke box at the right are the initial superheater and also a reheater, wherein the steam passing from the high-pressure cylinder to the low pressure is superheated by the flue gases. The initial superheater consists of a single coil of seamless steel tubing, through which steam passes in a direction opposite to that of the hot gases. The reheater is built up of a large number of small tubes expanded into headers. The superheater and reheater are suspended from rollers on an overhead track which allows freedom for expansion of piping and affords an easy means of removal from the smoke box, should occasion require it. The engine cylinders, as well as all the high-pressure piping and valves, are also located in the smoke box and jacketed by flue gases to prevent radiation losses. The engine exhausts through a closed feed water heater to a surface condenser, located back of the smoke box.

To save the heat waste incident to the use of direct-acting steam pumps the boiler feed pump, which is of the triplex gearless type, is driven by a belt directly from a pulley on the main engine shaft.



A Recently Developed 400-Hp. Power Plant Which Combines in a Single Unit a High-Pressure Boiler, Primary and Secondary Superheaters, a Compound Steam Engine, Feed Water Heater and Condenser



Longitudinal Section Showing the Arrangement of the Various Portions of a 400-Hp. Unit

The condenser, circulating and vacuum pumps are driven in the same manner. This unit will drive an alternating-current generator through a flexible coupling, the generator being mounted on a pier of sufficient hight to bring it in line with the engine shaft. Access to all parts of the unit is provided by platforms and ladders. All moving parts of the engine may be removed without disturbing any sheet metal work. Doors of ample size at the end on one side of the smoke box permit access to superheaters and piping.

There is an interesting feature in the boiler design. The corrugated furnace and rear tube sheet, instead of being permanently riveted to the boiler heads, are secured by stud bolts at each end. By removing the nuts from these studs, the furnace and tubes may be readily withdrawn from the boiler shell, thus providing a large opening for entering the shell and permitting convenient access to the tubes for scaling, etc. To provide a large combustion chamber a firebrick-lined extension in the form of a semi-Dutch oven is built on at the furnace end of the boiler.

The unit illustrated was built for the Corpus Christi Railway & Light Company, Corpus Christi, Texas, and was designed for the use of crude oil as fuel. Shop tests of this unit showed a fuel economy of 0.09 lb. of fuel oil per i. hp., which corresponds to about 1½ lb. per kw.-hr. The length of the unit is 30 ft., its hight to the top of the 10-ft. flywheels is 15 ft. and the width over the flywheel rims is 12 ft.

Buckeye-mobiles are being offered in nine sizes, ranging from 75 to 600 hp. By slight changes in the furnace design, they are adaptable to any available fuel.

Prices of commodities have rapidly risen the past few months in Great Britain. The London Economist publishes monthly a table giving a comparison of prices with a considerable prior period. The comparison is based on an index number consisting of the average of prices on a wide range of commodities for 1901 to 1905, which is taken as 100. Average prices for March on the same commodities indicated over 150, thus showing that prices are 50 per cent. higher than in the years 1901 to 1905. They were also considerably higher than those of any preceding month of the previous 15.

Southern California Industrial Situation

(*Special Correspondence*)

LOS ANGELES, CAL., May 5, 1915.—Expansion in the foundry and machine business in Southern California waits very much on an increased consumption of fuel oil. This must be reached through export. The world-wide disturbance of conditions does not give any early promise in this regard. The result is that business men of Los Angeles identified with the iron and steel industry do not expect anything but spotty improvement. In other words, oil well development has been stayed. Capacity exceeds sales and makers of oil well supplies are not encouraged, and this means foundrymen among others. Meanwhile, good oil properties remain untouched, with the oil left in nature's storehouse.

One other avenue to greater activity lies in widening the area of irrigation. Capital appears very shy at present. The sentiment here and there against immoderate expansion in orange groves and the growing of citrus fruits generally has resulted in overproduction of alfalfa in some sections, with no live stock to consume it. Prosperity accordingly has not been statewide. The fact that there is not a good balance among the products raised on the soil has apparently had an unsettling influence on the financial community. The great necessity is water through the dry months. Water carriage projects involve considerable money owing to the distances involved. The water supply to Los Angeles, it will be recalled, comes through a pipe line much over 200 miles in length, and had the city not undertaken the work, it is doubtful if the city's remarkable expansion would have occurred. In the irrigation work it is likely more attention will be paid than formerly to impounding reservoirs to catch and hold the run off, but much of this construction will be satisfied by concrete, and the iron and steel business will be benefited only indirectly. As it is, irrigation work constitutes a steady business, and some tank builders formerly occupied largely in constructing tanks for oil companies are making sheet steel conduits for water.

Building work is dull. There has been overbuilding to the extent that while the newer fine business structures in Los Angeles are well filled, it has been at the expense of the smaller and older buildings. School buildings offer the most promising opportunities in the immediate future. W. W. M.

Swedish pig iron is reported to be selling for export at $29.20 per ton compared with $24.33 before the war, with satisfactory demand. Germany is now the largest consumer, though Great Britain was before the war, and the Japanese demand is said to be well maintained.

Liquid Fuel for Foundry Cupolas

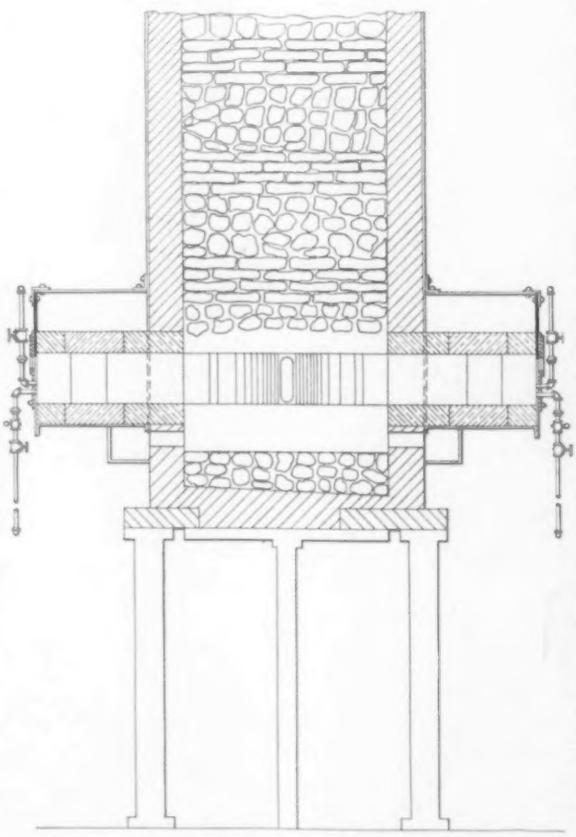
Substantial Economy and Low Sulphur from the Substitution of Oil for Coke—Other Advantages for Iron and Converter Steel Foundries

BY EDWIN F. CONE

A forward step in foundry metallurgy has recently been taken—a step that has a distinct bearing on the future operations and results of iron and converter steel foundries. It involves the substitution of liquid fuel for coke in cupolas, giving more economical fuel consumption per ton of iron melted and a lower sulphur content in the iron or steel castings made.

In *The Iron Age* of February 25 attention was called to a patent granted to Bradley Stoughton, secretary of the American Institute of Mining Engineers, in which liquid fuel is recommended to supply all or nearly all the heat necessary to melt metals or smelt ores, thus rendering possible the use of a minimum quantity of solid fuel. Fluid and solid fuels are used together, but are burned in a new way, involving a new principle and with new results. The essential features are the use of sufficient fluid fuel to supply all or practically all the heat required, and the use of a minimum quantity of solid fuel, which is to be maintained incandescent so as to insure the complete consumption of the fluid fuel without waste. An essential feature consists in admitting enough air to insure complete combustion of the fluid fuel and in addition just enough to maintain the solid fuel incandescent so as to consume as little of this as possible.

The principle involved in the patent has recently had practical application in the steel foundry of the Eagan-Rogers Steel & Iron Company, at Crum Lynn, Pa., and some interesting results have been obtained. The illustration shows how the principle in general is applied to a cupola. The amount of coke used in ordinary practice is deposited on the bed of the cupola and on this a layer of iron and scrap. Another layer of coke is then deposited, with the usual charge of metal on this, and so on. The coke bed is then ignited and the oil injected, mixed with air, into the incandescent mass through four tuyeres. The upper layers of coke are intended to replace the unavoidable losses from the bed as well as to supply a portion of the heat necessary. They are therefore made as thin as possible and are but a fraction of the amount used in ordinary practice. The air for maintaining the incandescence of the coke is admitted by separate small tuyeres at the bottom and under the oil tuyeres.



Lower Section of a Cupola Showing in General the Application of Oil Burners to Partly Replace Coke as a Fuel. Two of the Four Ore Tuyeres are Shown

In the 42-inch Whiting cupola of the Eagan-Rogers foundry, where a high-silicon low-phosphorus iron has been heretofore melted by coke and then blown in a Stoughton converter and poured into steel castings, it has been the custom to use 1000 lb. of coke in the bed and an average of about 245 lb. of coke between each layer of metal above this. The average consumption of coke according to this practice has been about 245 lb. per 1000 lb. of iron melted. Early in March the cupola was equipped with the new melting device using fuel oil, and operations have been conducted under these conditions ever since with gratifying results.

Various trial runs early in March resulted in a marked diminution in the coke consumed, compared with the former method. In one of the first trials 25,000 lb. of pig iron and foundry steel scrap, which usually averages 50 to 60 per cent. of the total charge of iron and scrap, were melted with 2980 lb. of coke and 87 gal. of oil, or a consumption of 115 lb. of coke per 1000 lb. of metal. Later runs were:

20,300 lb. of metal melted with 2100 lb. of coke and 72 gal. of oil or 105 lb. of coke per 1000 lb. of metal.
22,100 lb. of metal melted with 1524 lb. of coke and 79 gal. of oil or 70 lb. of coke per 1000 lb. of metal.
21,300 lb. of metal melted with 1050 lb. of coke and 75 gal. of oil or 50 lb. of coke per 1000 lb. of metal.

Later results have averaged 30 lb. of coke per 1000 lb. of metal melted, with decided savings in cost per ton, compared with the method of using coke only. That is, by using a bed of 1000 lb. of coke and layers of coke of only 30 lb., instead of 245 lb. previously, per 1000 lb. of metal melted, the use of oil has effected decided economies.

The proverbial high sulphur content of iron melted with coke and of steel castings made by the converter process is recognized. By this process a decided lowering of sulphur is inevitable, and it has been borne out by the experience at the Eagan-Rogers plant. Using over 50 per cent. of scrap made by the older method, the sulphur content has constantly diminished until it is at least 30 points lower than formerly.

The experience at this foundry has developed other points of superiority. It is found that a given charge melts more quickly than formerly and is also hotter at the finish; it is claimed that 10 to 12 tons per hour can be melted, as compared with 7 to 8 tons

previously. Not only is the required blast pressure less but the regulation of the cupola is claimed to be better. The element of saving effected in the handling of less coke and ashes is also important, the details of which have not been yet worked out.

While it is recognized that the results thus far achieved in practice under this patent are preliminary as to absolute definiteness, it is apparent that the possibilities are of decided value and importance to foundry metallurgy. In order to ascertain on a fairly large scale the actual and definite possibilities and limitations of the process, arrangements have been made to carry out extensive operations of an investigating nature in a special plant to determine what can be accomplished under various conditions and with various metals and materials. Details of these results will be available later.

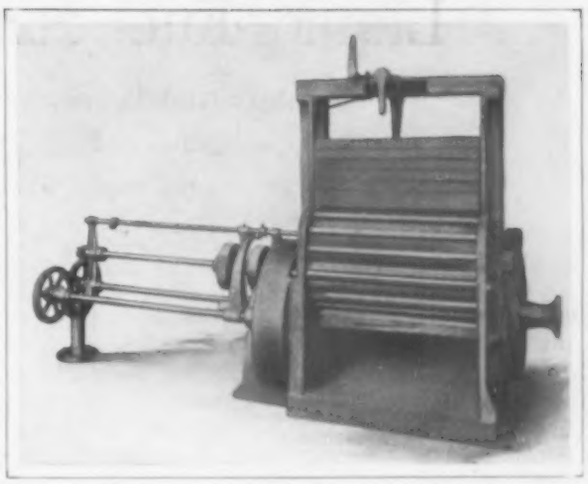
A New Press for Baling Scrap Metal

For compressing metal scrap of various kinds into bundles that can be conveniently packed in a charging box the Tempus Reclaiming & Mfg. Company, 25 North Seventh street, Philadelphia, Pa., has brought out a new scrap metal baling press. This machine is a stationary one and forms cylindrical bundles while the other, which was illustrated in *The Iron Age*, November 16, 1914, produced rectangular bundles and was of the portable type, so that it could be moved around from place to place wherever the scrap accumulated. Among the classes of material which the new press will handle are tangled wire, bushy turnings, wire cable, spring beds, tubing, light pipe and angles, stamped ware, etc.

The general construction of the press is simple and rugged. Cast iron is used for the main frame and the base, while the rods, braces and other parts subject to strain are made of steel. Steel plates which can be readily replaced at a nominal cost are used to line the interior where the greatest wear occurs. The shafting is of steel and runs in roller or babbitted bearings. Dustproof lubricating devices are provided. The gears are all cut from solid blanks and have dustproof guards. Steel is used for the larger gears and cast iron for the others. Friction clutches operated by levers conveniently located on the front of the machine, control the operation of the driving mechanism which can be belted either to the main shaft or connected directly to any motive power. The power consumption of the machine is 5 hp.

In operation a piece of ragged metal or any scrap of a tangled nature is inserted in the slot of the revolving mandrel below the corrugated roll. After this has been done, the power is started to get the stock firmly fixed in the mandrel, after which the scrap is thrown on the projecting portion. As soon as this is done the scrap begins to be drawn in, and as the material accumulates on the mandrel it is pressed down by the corrugated roller which is provided with weights up to 1500 lb. After the bundle is formed a piece of old wire is hooked in while the mandrel rotates and a few turns ties the mass. The machine is stopped, and after the loose ends of the wire are tucked in, the direction of rotation of the mandrel is reversed. A few turns, it is emphasized, are sufficient to loosen the mandrel, and it is drawn out. After the mandrel is removed a ratchet wrench is applied to the hexagon head of the hub of the corrugated roller, which is shown projecting at the right, and in this way the roller is turned through an arc of 180 deg. and the bundle thrown out.

The winch head on the right side of the machine



A Press for Compressing Metal Scrap into Cylindrical Bales That Can Be Easily Packed in a Charging Box

is used for unloading the stock from the wagons which bring it to the plant. As these wagon loads are generally practically one mass the entire load can be removed in a short space of time. Another use made of this winch head is to draw the stock up to a convenient position for inserting it in the mandrel.

The bales made by the machine are 18 in. in diameter and 26 in. long. The weight varies according to the character of the scrap being handled from 250 to 700 lb. The floor space occupied by the machine measures 4 x 8 ft., and the machine, which weighs 4000 lb., has a pulling power of 8 tons.

Pan-American Delegates Will Visit Factories

WASHINGTON, D. C., May 11, 1915.—The most important manufacturing establishments of the East and Central West, including some of the largest plants in the iron and steel industry, are to be inspected by the delegates from the 18 countries of Central and South America to the Pan-American Financial Congress, which convenes in this city May 24. Secretary McAdoo, of the Treasury Department, who is planning the entertainment of the delegates, regards this visit as one of the most important features of the programme. In his opinion it will give the visitors "some insight into methods of life and industry under conditions obtaining in the United States as a great object lesson of the resources and capabilities of North Americans." While the itinerary has not been finally determined, the tentative schedule is as follows: Baltimore, May 31; Philadelphia, June 1 and part of June 2; Pittsburgh, June 3 and 4; St. Louis, June 5 and part of June 6; Chicago, June 7 and 8; Detroit, June 9; Buffalo and Niagara Falls, June 10; Schenectady, June 11; Boston, June 12 and part of June 13; New York, June 14 and 15. It will be noted that it is planned to begin the investigation tour after a week of discussion. Managers of plants located in the cities referred to, or any other cities not too remote therefrom, who desire that the delegates shall visit their establishments, should communicate at once with Secretary McAdoo. The selection of plants to be visited will be based upon their relative importance and typical character in the industries to which they are related. W. L. C.

The Allis-Chalmers Mfg. Company, whose annual report was published in *The Iron Age* of last week, has also issued a statement for the first three months of the current year. January and February showed a loss on operations of $44,716 and $14,666 respectively, but March scored a profit of $50,467, so that the quarter displayed a loss of only $8915. The improvement in March is credited partly to war orders and partly to better domestic trade conditions following the revival of copper mining. The company states that business now being booked will make itself felt in the reports of the company in the next few months.

A Method for Determining Gases in Steel

New Principle Involved in a German Device for Liberating Nitrogen, Hydrogen and Oxides of Carbon—Gases in Commercial Steels

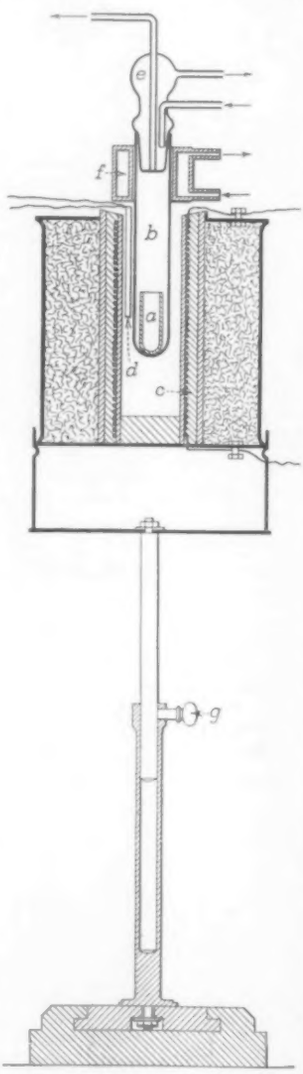
A new method of determining the gases in iron or steel has recently been published in Germany by P. Goerens and J. Paquet in Ferrum, a German journal devoted to technical progress in the iron and steel industry. The article, entitled "Ueber Eine Neue Methode zur Bestimmung der Gase im Eisen," goes into every detail of the apparatus, its manipulation and the results achieved and covers the determination of carbon dioxide, carbon monoxide, hydrogen and nitrogen. An abstract follows:

If chips of iron are heated in a vacuum a mixture of CO_2, CO, H and N is given off. The quantity of the gases depends on the conditions under which the experiment is carried out, being influenced by the degree and length of the heating as well as by the character and form of the material tested. Previous methods of determining the gases rest almost entirely on heating the metal in a vacuum. The results are comparable only when obtained under similar conditions. But by all these methods the total quantity of gas cannot be obtained. A new method is here described which endeavors to remove the principal objections to previous ones.

The principle of the new method consists in melting in a vacuum the metal to be tested with tin and antimony to a thin fluid alloy and analyzing the gases thus released. The apparatus consists of three parts: The melting apparatus, the air pump and the analyzing apparatus. The melting of the material to be tested is done by electrically controlled heat in a magnesia crucible, the gas contents of which have been carefully removed.

The illustration shows the melting device. The magnesia crucible *a*, with its mixture of the sample and the tin and antimony, is put into a thick-walled reagent tube, *b*, made of molten rock crystal, which is heated to the required temperature by means of an electric resistance furnace, *c*. The temperature is controlled by means of a thermoelement, *d*, inserted between the tube containing the crucible and the wall of the electric oven. The closing of the reagent tube is accomplished by means of a water-cooled stopper, *e*, which is also made of molten rock crystal. To prevent a heating up of the stopper as well as to furnish a support for the tube, a water-cooled brass ring, *f*, is supplied. The furnace, *c*, can be raised or lowered by means of the arrangement at *g*.

The selection of a sample is especially important as gases are not uniformly distributed in steel as iron. In order to obtain an average sample it is better to plane or mill a complete cross section, care being taken that no traces of oil or moisture are absorbed. The sample is mixed with a corresponding quantity of antimony and tin, the Kahlbaum products being recommended as having negligible amounts of gas in them, and then placed in the magnesia crucible.



Apparatus Used to Melt the Steel with Tin and Antimony to Expel the Gases for Analysis

Commenting on the results of the method, the authors say:

Of the different gases which are determined by this method, the larger part is given off during the melting while the mechanically held oxides react with the constantly present carbon to form CO_2 and CO. On the other hand CO_2 and CO react with the metal as well as with the carbon. Therefore it is impossible to separate the gases actually in the metal from those which result from these reactions. For judging the material, therefore, it suffices to establish the total quantity of gas independent of its origin. It is, in fact, clear that a poorly deoxidized steel, in which, besides the carbon, there is an appreciable amount of oxides which can react to form oxides of carbon, is of poorer quality than a steel well deoxidized which contains less gas. It has been shown that well deoxidized material such as electric steel has a smaller quantity of gas than ordinary steels.

Another difficulty arises in connection with the information furnished by the analyses. It is known that a mixture of CO_2 and CO in conjunction with carbon changes its composition with the temperature. These changes follow the tendency that by lower temperature mixtures ensue rich in CO_2, so that it cannot be definitely stated whether the CO_2 found by the analysis was really in the metal or was formed by decomposition of the CO. It would be expedient, perhaps, to calculate the CO_2 found to CO under the assumption that the CO_2 found arose from the decomposition of the CO. According to the researches of Goutal the presence of CO_2 in iron at ordinary temperatures is denied.

The results by this method of various analyses of different kinds of steel are given in the table. The total gas content is expressed in cubic centimeters per 100 grams while the various gases are reported in percentage by weight. Commenting on these results the authors say:

Total Gas Content.—The lowest total gas content was found in low carbon electric steel, well deoxidized material showing 10 to 15 cu. cm. of gas per 100 grams of metal. High carbon electric steel contains in general more gas, but this is not proportional to the carbon content. In badly deoxidized electric steel the gas content rises to tenfold, as shown by samples 18 and 20. Bessemer and open-hearth steel show average gas contents of 22 to 78 cu. cm. per 100 grams.

Oxides of Carbon.—The CO_2 varies from 0.0020 to 0.0200 per cent. by weight, but as the amount depends on the method of conducting the analysis, the figures do not offer a sure account of the actual CO_2 present. The CO ranges from 0.0015 to over 0.1000 per cent. in sample 26. High content of CO is generally a proof that deoxidation was not complete. In a carefully manufactured nickel-chrome steel, sample No. 9, the

CO content is 0.0015 per cent. It is customary to add ferrosilicon to modify the percentage of CO, yet in this sample with 0.10 per cent. silicon present, the steel is not free from CO. Also in sample No. 18 of similar composition nearly 40 times as much CO is present with a percentage of silicon of 0.17. In the crucible steels, where 0.12 to 0.24 per cent. of silicon is present, the presence of this gas is by no means low.

Hydrogen.—The hydrogen ranges from 0.0002 to 0.0047 per cent. Carefully prepared, well deoxidized ingot steel contains as a rule but little hydrogen. Ferromanganese often contains considerable hydrogen which adds to the amount in the final steel.

Nitrogen.—The content of nitrogen varies between nothing and 0.0141 per cent., being particularly low in the electric steels.

The article also contains a detailed discussion of the relation of the gases and their proportion in the different stages of steel manufacture by different processes, as well as in the refinement of open-hearth steel in the electric furnace. The results are displayed both by charts and by tables and are decidedly interesting and thorough.

Table Showing the Gas Contents and Composition of Various Grades of Steel Determined by the New Method

Sample	Carbon, per cent.	Manganese, per cent.	Phosphorus, per cent.	Sulphur, per cent.	Silicon, per cent.	Nickel, per cent.	Chromium, per cent.	Gas in cucm. per 100 g. metal	Carbon dioxide, CO_2, per cent.	Carbon monoxide, CO, per cent.	Hydrogen, per cent.	Nitrogen, per cent.	Total gas, per cent.
Basic Bessemer ingots:													
1	0.05	0.36	0.110	0.045	....	...	...	22	0.0040	0.0196	0.0003	0.0029	0.0268
2	0.08	0.40	0.080	0.048	....	...	...	40	0.0090	0.0352	0.0006	0.0025	0.0383
3	0.05	...	0.080	0.040	....	...	...	41	0.0077	0.0342	0.0006	0.0065	0.0413
4	0.05	0.40	0.080	0.040	....	...	...	49	0.0061	0.0393	0.0006	0.0122	0.0521
Open-hearth ingots:													
5	0.08	0.40	0.050	0.030	....	...	...	38	0.0048	0.0341	0.0005	0.0061	0.0455
6	0.15	0.37	0.060	0.060	....	...	...	46	0.0048	0.0410	0.0009	0.0024	0.0443
7	0.08	0.44	0.040	0.037	....	...	...	78	0.0178	0.0785	0.0007	0.0020	0.0812
Electric steel:													
8	0.19	0.50	0.020	0.012	0.420	...	...	10	0.0047	0.0061	0.0002	0.0015	0.0125
9	0.08	0.35	0.010	0.010	0.090	4.34	1.10	13	0.0082	0.0015	0.0007	0.0000	0.0104
10	0.10	0.38	0.011	0.010	0.070	3.30	...	15	0.0064	0.0061	0.0007	0.0000	0.0132
11	0.15	0.49	0.011	0.012	0.450	...	...	25	0.0058	0.0092	0.0012	0.0048	0.0210
12	0.26	0.43	0.068	0.023	0.015	...	...	25	0.0053	0.0098	0.0012	0.0041	0.0214
13	0.10	0.40	0.010	0.012	0.100	...	...	28	0.0053	0.0207	0.0008	0.0019	0.0287
14	0.45	0.38	0.018	0.022	1.270	...	...	32	0.0058	0.0167	0.0013	0.0042	0.0280
15	0.98	0.45	0.158	0.075	0.015	...	...	70	0.0043	0.0688	0.0010	0.0083	0.0824
16	0.71	0.37	0.018	0.016	0.230	...	...	73	0.0106	0.0684	0.0010	0.0078	0.0878
17	1.35	0.44	0.020	0.015	0.190	...	0.37	88	0.0053	0.0851	0.0010	0.0141	0.1055
18	0.10	0.35	0.009	0.008	0.170	2.62	0.90	94	0.0018	0.0569	0.0047	0.0012	0.0646
19	1.16	0.38	0.017	0.016	0.180	...	...	94	0.0050	0.0900	0.0011	0.0124	0.1085
20	0.33	0.38	0.026	0.016	0.100	3.06	1.94	105	0.0109	0.0708	0.0039	0.0056	0.0912
Crucible steel:						Ni.	Wo.						
21	0.38	0.26	0.056	0.021	0.190	...	0.65	29	0.0090	0.0248	0.0004	0.0024	0.0366
22	0.84	0.36	0.041	0.017	0.150	...	...	41	0.0058	0.0391	0.0007	0.0015	0.0471
							Cr.						
23	0.16	0.44	0.008	0.008	0.290	4.00	0.91	50	0.0032	0.0271	0.0022	0.0053	0.0378
24	0.47	...	0.020	0.028	....	2.98	1.29	51	0.0200	0.0257	0.0016	0.0068	0.0541
25	0.97	0.14	....	0.010	0.120	...	...	79	0.0098	0.0712	0.0017	0.0020	0.0847
26	0.27	0.45	0.010	0.012	0.240	4.00	1.30	152	0.0096	0.1290	0.0041	0.0082	0.1509

Southern Roads and the Cummins Law

WASHINGTON, D. C., May 11, 1915.—The railroads in Southern Classification territory, in view of the taking effect June 3 of the Cummins law abolishing the limited liability feature of the uniform bill of lading, have filed a notice with the Interstate Commerce Commission canceling Rule 1 of the existing tariff and promulgating a new rule which foreshadows a revised bill of lading imposing new conditions on shippers as the price of the continuance of the minimum rates heretofore in force. No intimation has been received by the commission as to what these conditions will be, but it can be stated that if they are regarded as unduly vexatious the new rule will be suspended and a special investigation ordered. In the meantime, the commission is giving consideration to the general scope of the Cummins law in the light of the hearing of representatives of leading carriers recently held, and a comprehensive opinion will soon be made public, presumably before the law goes into force.

The new rule continues existing rates, but gives notice of an intention to substitute a new bill of lading, and is as follows:

The rates governed by the classification are on the basis of bill of lading conditions limiting the liability of the carriers. By an act of Congress, approved March 4, 1915, additional liability as to interstate traffic has been imposed upon the carriers from and after June 3, 1915. It is physically impossible to revise tariffs, classifications and exception sheets to conform to the requirements of the law as amended, and to become effective June 3. Hence, it becomes necessary to make some temporary provision applying to interstate tariffs that will remove doubt as to application of rates from and after June 3, 1915. To this end Rule 1 is revised to read as follows:

Section A.—All rates governed by this classification apply only on property shipped subject to the conditions of the carrier's bill of lading in use on and after June 3, 1915, and, except as otherwise provided herein, all interstate rates in force June 2, 1915, will continue in force on and after June 3, 1915, disregarding provisions in tariffs, classifications and exception sheets which limit the liability of carriers.

Section B.—Property carried not subject to the terms and conditions of the carrier's bill of lading will be at the carrier's liability, limited only as provided by common law and by the laws of the United States and of the several States, in so far as they may apply, and property so carried will be charged at a rate 10 per cent. higher than the actual rate shown in published tariffs.

Officials of the Interstate Commerce Commission assume that the carriers will file copies of the new bill of lading before June 3, and the opinion is expressed that if its terms are materially different from the bill now in use its employment will not be permitted until 30 days after it is filed, and then only in the event that it is approved by the commission.

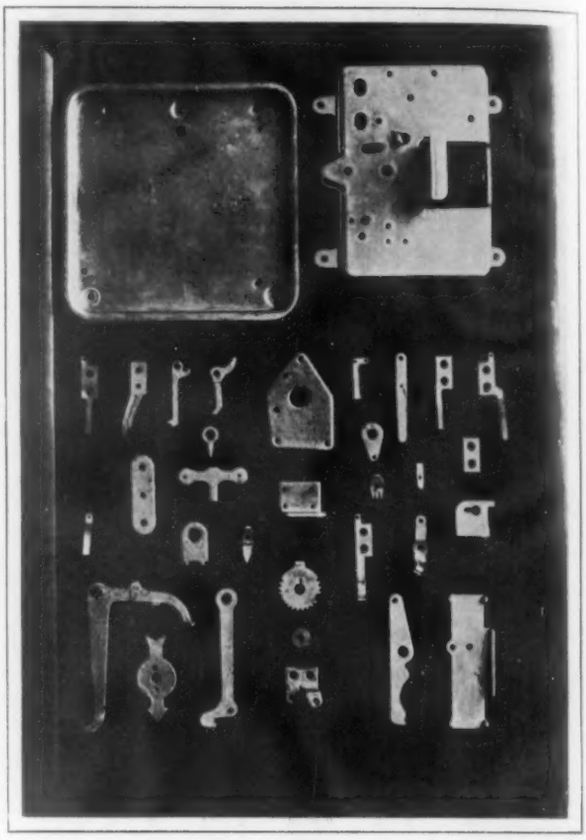
No other roads having given notice of an intention to change rates or bill of lading conditions, it is believed by the commission that no such changes will be sought, at least until the commission's opinion in the matter has been made public and probably not until after the railroads have had six months' experience under the new conditions. W. L. C.

It is reported in Commerce Reports that a new company is being formed in Santiago, Chile, for establishing a tin smelter for treating the raw material obtained from Bolivian tin mines. It is to be located at Arica or Mijillones.

Building Precise Dies on a Rush Order

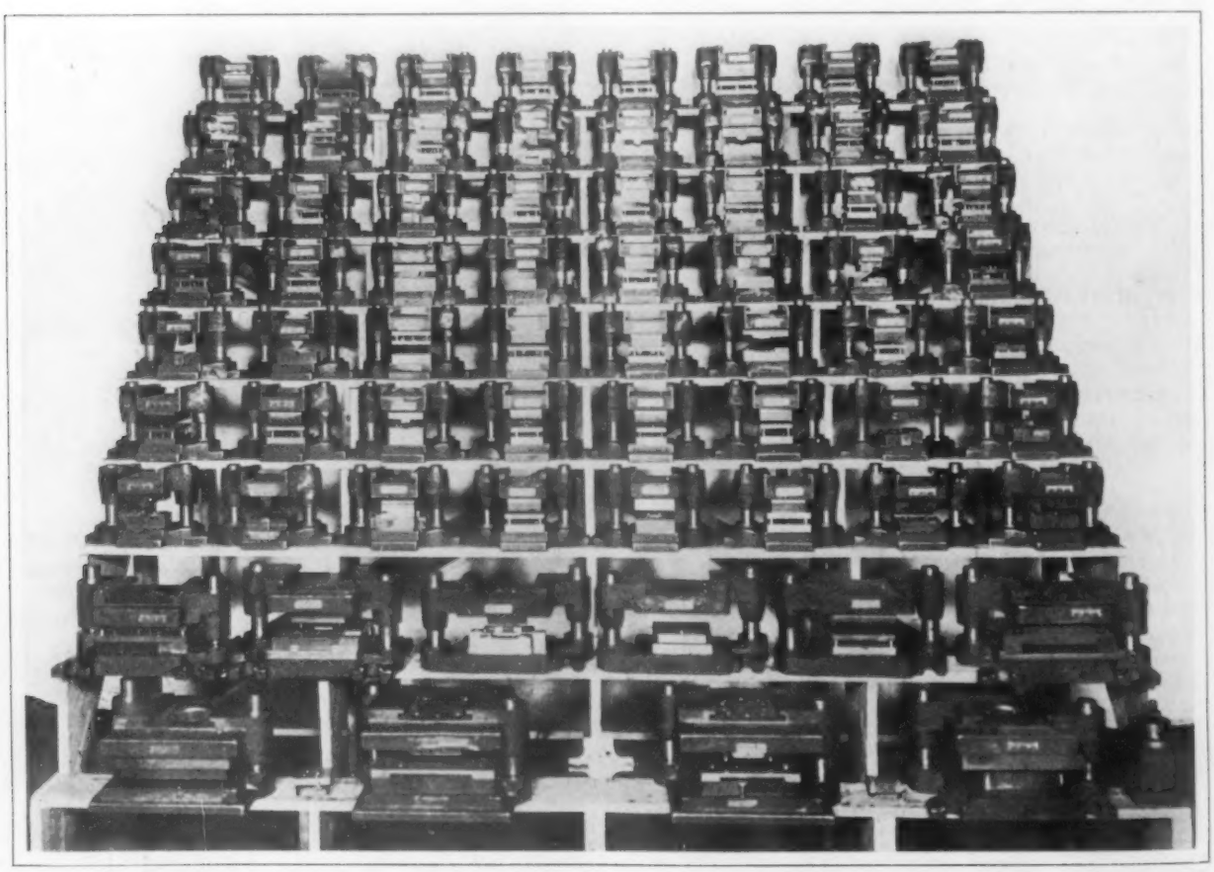
An unusually interesting job of die making, involving the design and building of a complete set of 72 dies, was recently completed by the H. G. Saal Company, Chicago, Ill. The operating parts and case of a telephone lockout device, controlled by the Adsit General Electric Company, Minneapolis, Minn., and comprising 33 separate pieces, were formed with these dies. The instrument is exceedingly sensitive in its operation and accordingly the dies were required to be finished to sizes within limits of variance of 0.0005 to 0.001 in. for perforating and 0.001 to 0.002 in. for the forming operations. The parts themselves are made from metal varying in thickness from 0.005 to 0.093 in.

The complete set comprises dies for blanking, perforating, forming, drawing and burring. Among these there are no open dies, all being subpress dies, in the building of which the Saal Company specializes. As indicated, the dies are made so that all may be used in but two sizes of presses. A feature of the die construction are the large hardened and ground ladder pins which insure a perfect alignment of the punch and die. It is thus possible to use these dies in punch presses where the ram fits loosely into the die slides as well as where the slides are tight which adds flexibility in the use of the dies and results in a saving of power. The particularly interesting fact in connection with the building of this set of dies was the fact that they were completed on a rush order in 32 working days, during which the largest number of men working on the job at any one time was 27. The Saal Company is an advocate of the sub-die not only because stampings which in their making admit of the use of sub-dies, can be made more cheaply, but because the time for setting up presses with sub-dies, as compared with open dies, is reduced by 75 per cent., while the cost of repairs is less by a similar proportion.



Parts of a Telephone Lockout Device Produced with the Dies

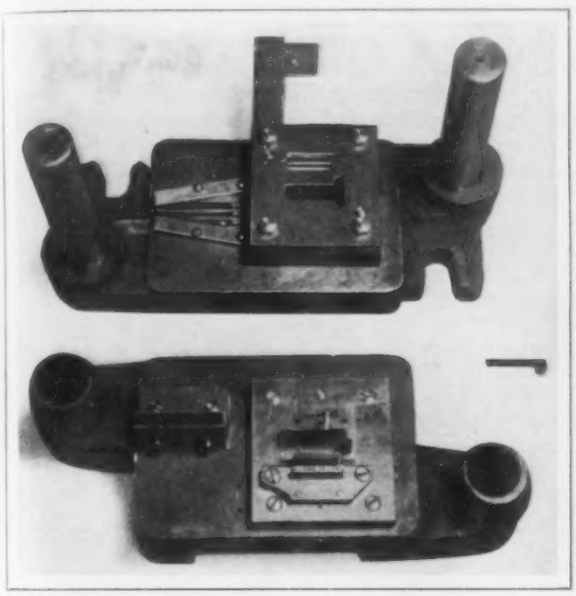
A further example of the character of the dies which this company is equipped to make is a follow die in combination with a bridge die designed to form complete a metal hinge for a file binder. The



A Set of 72 Dies That Were Designed and Made in 32 Working Dies

first operation punches small holes on one side of the stamping and a row of prick punch marks on the other side. The stamping is then blanked out, and the press in which the die is mounted, being suitably inclined, the stamping slides out by gravity, back through the die into the forming die which forms it in a V-shape.

The plant of the Saal Company, in addition to



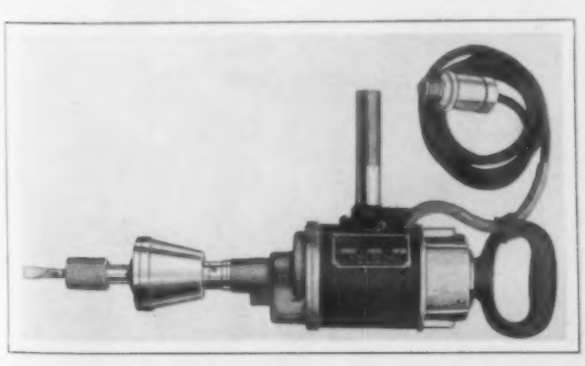
A Die for Completely Forming the Metal Hinge of a File Binder in One Operation

the machine shop equipment necessary to the manufacture of such dies as the above, includes a press room for the handling of contract stamping work, an electro-plating installation with equipment for a range of finishes up to the highest polish, a japanning department and an assembly room adaptable in its facilities to a wide variety of work.

A Screw Driver with Motor Drive

For effecting savings in time and labor where large numbers of wood or lag screws have to be driven or nuts put on, the United States Electrical Tool Company, Cincinnati, Ohio, has developed an electric screw driver. The tool is equipped with a universal motor to operate on either direct or alternating current circuits, a friction clutch with a spring release controlling the starting and stopping of the driving bit. This clutch operates when pressure is applied to it to engage the motor with the bit and drive the screws. As soon as pressure is removed, the clutch is released and the motor continues to run while the driving bit is stationary.

An instance of the savings effected by the use of this tool was a case in the Middle West, where a large number of screws of small size had to be driven, and the time for completing the work was somewhat restricted. In this instance, 50 gross of No. 11 screws, 1½ in. long, was driven in 54½ hr., 25½ of which was chargeable to the carpenter and the remainder to the apprentice.

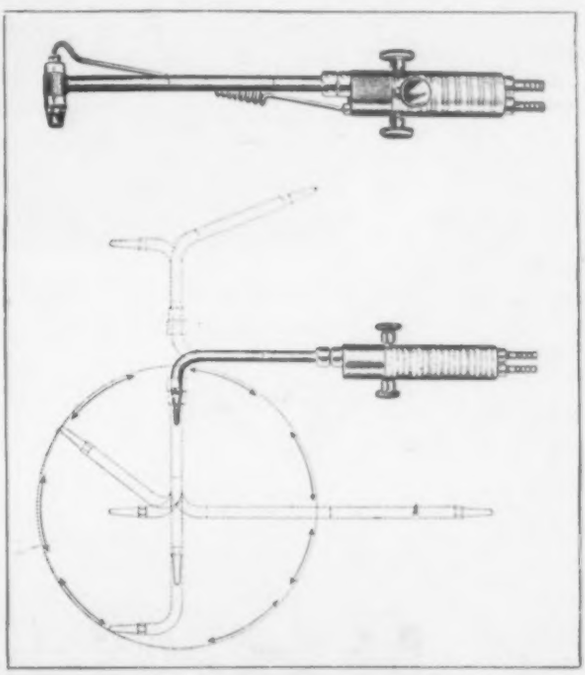


A Motor-Driven Tool for Driving Wood or Lag Screws or Putting On Nuts

Autogenous Welding and Cutting Torch

The Turner Brass Works, Sycamore, Ill., has brought out a new cutting and welding torch. It is intended for use with autogenous welding equipment and can be operated with one hand, as all the valves are grouped so as to be controlled by a slight movement of the thumb and forefinger. The valve controlling the oxygen jet when cutting is being done can be adjusted to a fixed position, thus avoiding the necessity of holding the valve down when long cutting operations are being handled.

The mixing chamber is located in the handle instead of the head which, it is emphasized, keeps



A Recently Developed Cutting and Welding Torch in Which All the Control Valves Are Centralized and the Oxygen Valve Can Be Adjusted to the Desired Position without Requiring Further Attention. The Lower Drawing Shows How the Cutting Torch Can Be Adjusted to Many Positions by Using an Angle Attachment

the torch cool and reduces the danger of having the flame pop out. The welding torch requires only one hand to control it, so that the other hand is free for the work that is being done. Two valves in the handle regulate the flame used, a slight movement of the forefinger or thumb giving the operator complete control without releasing his grip on the handle.

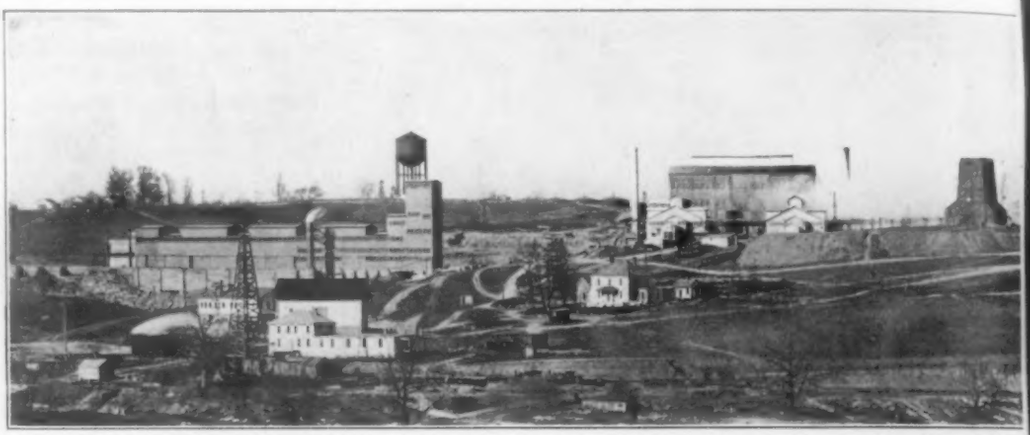
Included in the equipment of the welding torch are three sections and an angle attachment. These enable the torch to be used in various positions and different lengths, as is brought out in the lower portion of the accompanying illustration.

The Whiting Foundry Equipment Company, Harvey, Ill., has taken over the foundry equipment business of the Central Iron Works, Quincy, Ill., adding to its line the dust arrester and water cinder mills formerly manufactured by the latter company, retaining one of its engineers on exhaust system equipment for the benefit of prospective purchasers. It is also prepared to furnish repairs for any of the Central Iron Works equipment now in use.

Zinc Manufacture in the Pittsburgh District

The Plant of the American Zinc & Chemical Company at Langeloth, Pa.—Employees' Houses with Special Features of Construction

In April, 1913, through the efforts of Ralph Cooke, industrial agent of the Pennsylvania Lines West, the American Zinc & Chemical Company, an identified interest of the American Metal Company, New York, secured about 900 acres of ground two miles south of Burgettstown, Pa., on the main line of the Pittsburgh, Cincinnati, Chicago & St. Louis Railroad. Of this, 400 acres located on the crest of a hill and admirably adapted for the purpose, was set aside for a plant for the manufacture of spelter and its by-products, sulphuric acid, while about 500 acres located just west of the plant site were reserved for the building of a new town for employees to be named Langeloth, in honor of a chairman of the board of the American Metal Company, who died less than a year ago.

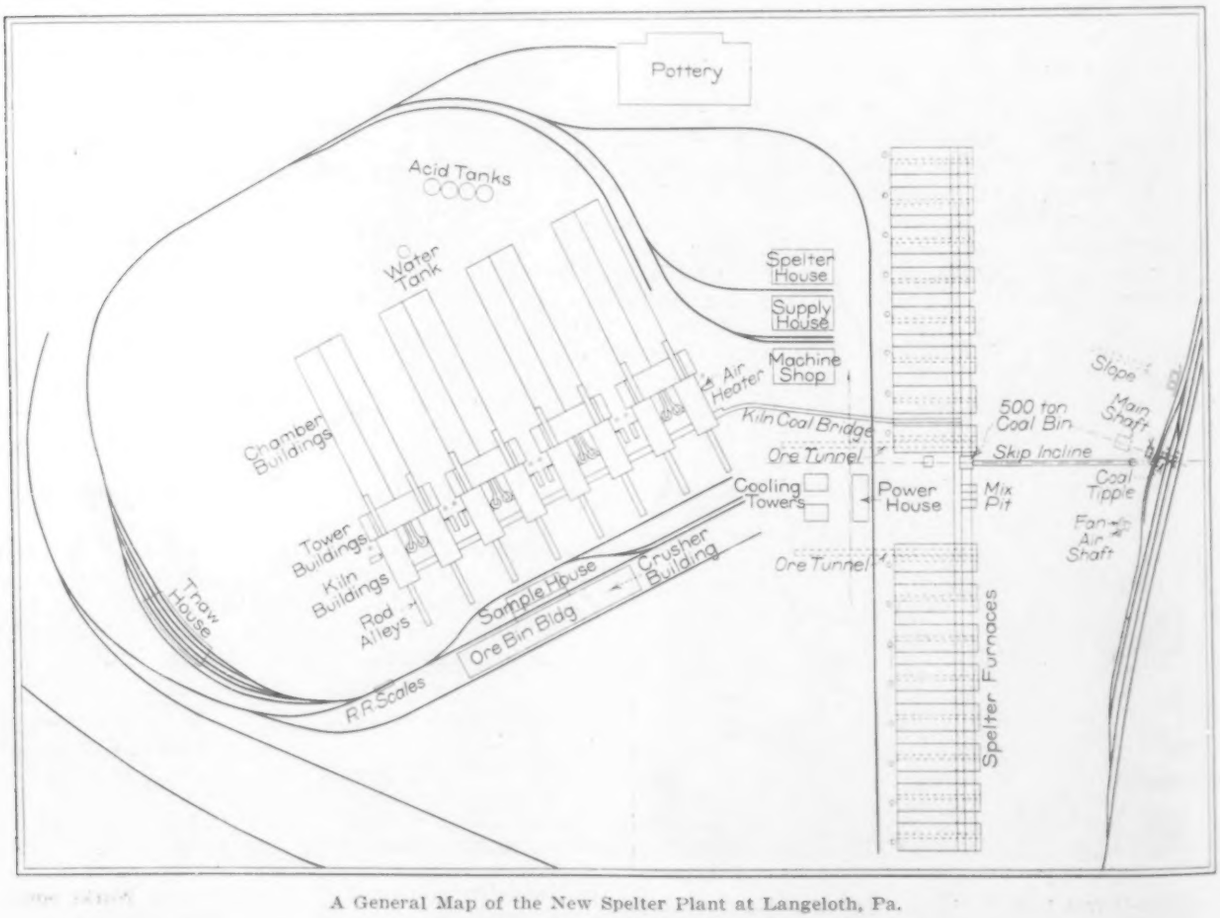


Ore Bin and Crusher Building

Tower Building
Roasting Furnaces

Active work on the plant was started in June, 1913, and in a little more than a year the first unit was finished and put in operation. The ground plan, as shown in an illustration, gives an idea of the general layout of the plant, but it should be noted that only one unit has been completed. The three units to the left are prospective, while that to the extreme right is finished and in operation.

There are direct sidings from the main line of the Pennsylvania Railroad, also from a branch line



A General Map of the New Spelter Plant at Langeloth, Pa.

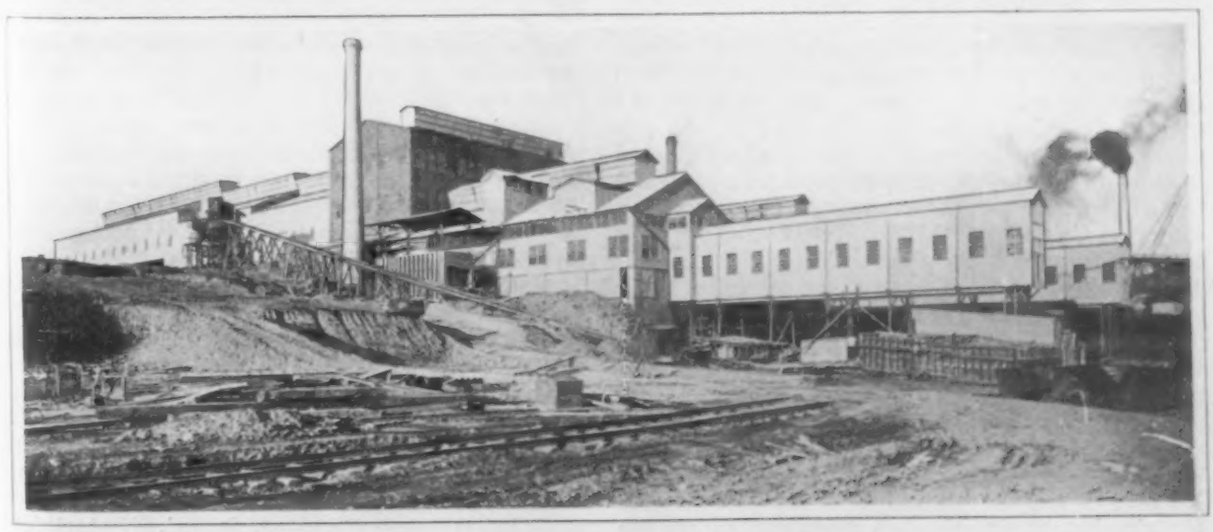
of that road, running from Burgettstown to Patterson mills, while the company itself has built a main service standard gauge line, which completely encircles its plant and also numerous switches connecting different departments.

In order to obtain a supply of pure water essential to its purposes, the company built a concrete dam just south of its works on its own property. This has a capacity for storing 15,000,000 gal., the reservoir being supplied by natural water sheds and springs. From this reservoir the water is pumped by centrifugal and plunger pumps through a 12-in. cast-iron pipe water line to a steel tank, built by the Des Moines Bridge & Iron Works, with a capacity of 250,000 gal., and from this tank water is taken to all departments of the plant through 12-in. mains.

The coal supply is obtained from about 2500 acres of Pittsburgh seam coal owned by the company. The mine is located near the smelter and the coal is delivered from the tipple to a steel incline, the cars being electrically hauled up this incline to a 500-ton steel storage bin. From a bridge under this bin, the cars are loaded by gravity and hauled by electric motors over steel bridges to bins located in different parts of the works. All the coal mining is done by machines, and in addition to the main hoisting shaft there is a slope entrance built of concrete, 8 ft. high, leading into the mines through which all supplies are taken and which is also used by the miners in going to and returning from work. The company has a supply of coal amply sufficient to meet its needs, when the four units of its plant have been built, for many years to come. The company intends to market the lump coal and use its slack for smelting purposes.

Power House Distillation Furnaces Coal Tipple

The smelting plant is located on high ground, with a view to having better working conditions for the men. This necessitated a large amount of excavating and concrete work. The different departments are so laid out that three additional units can be constructed without cramping or disturbing the operation of the present one. The present plant comprises a sample house, ore bin and crusher building; two roasting furnaces and their respective



The Upper Picture Shows the Concrete Ore Bins and Ore Crusher Building. In the Lower Are Shown the Roasting Furnaces with the Chamber Acid Plant to the Left

sulphuric acid systems; four distillation furnaces; carpenter and machine shop; supply house; coal mines and pottery. Very economical methods are used to receive, handle and store the ores used in the manufacture of zinc, and which come almost entirely from Missouri and Wisconsin. The ore is received in 50-ton capacity steel cars, which are delivered to the ore bins by a switching engine. The cars are weighed and the ore is unloaded into deep concrete bins. These ore bins are 22 ft. high, 20 ft. wide and 70 ft. long, there being seven of them with room for 13 more, each having a storage capacity of 2000 tons. The building is equipped with a 10-ton Shaw traveling crane with grab bucket. The latter distributes and carries the ore to the mill, which is equipped for handling coarse and fine ores.

The ores are dumped on a grizzly, the fines passing through and the coarse going to a jaw crusher. They then enter a Ruggles-Coles cylindrical drier. From the drier the ore is elevated to the screens, with the oversize returning to the rolls. The drier gases are passed through a steel dust collector, and then discharged into the chimney. Connected with the ore bin building is a sample room, in which samples of ore are taken from each car and treated by the regular processes in order to obtain a good average sample of the ore for assay purposes.

The Pottery Building

The roasting furnaces are of the Hegeler type, 20 x 80 ft., with modern improvements in both the furnaces proper and their machinery. Each furnace is double, seven hearths high, the dimensions of each hearth being 6 ft. x 20 ft., making about 6800 sq. ft. of hearth area. The large lower hearths are muffled. The interior arches have considerable spring and are built of tongue and grooved brick. A special brick is laid above each row of skewbacks to carry the weight of the rabble, which keeps it off the hearth, the latter can then rise and fall with the arches. The rakes are the usual style used in this class of roaster. An improvement in the rake rods is that they are jointed in sections thus allowing easy replacement of any part. The rods are drawn through the furnace by endless chains.

Each furnace is provided with a 9 x 15 gas producer with water cooled boshes, the fire gases being burned under the three lower ore hearths. Sirocco fans are used for furnishing air to the gas hearth and to the ore muffles. The waste heat gases pass through an air heater, which is composed of cast-iron "U" pipes, cold air flowing through in an opposite direction to the fire gases. The temperature of the fire gases entering the heater is about 800 deg. C. and hot air leaves at 400 deg. C. The hot air then passes through flues and enters the muffles through the middle wall. The use of preheated air gives good results in the matter of fuel economy. Fifty-five tons of ore are roasted per day, or 16 lb. per sq. ft. of hearth area, with a coal consumption of seven tons. The gases run 4 per cent. SO_2 by volume and reach the Glover tower at 380 deg. C.

THE SULPHURIC ACID DEPARTMENT

Two buildings contain the sulphuric acid department, one known as the Tower building, 95 x 220 ft., and the other the chamber building, 138 x 440 ft., the former being all steel and brick and the latter steel construction. The roast furnace gases on leaving the furnace pass through a centrifugal dust chamber, 30 ft. in hight and 20 ft. in diameter. The chamber has a hopper bottom so that dust can be drawn out into cars in an ore tunnel running underneath the roasting furnaces. The gases pass on to the Glover tower, which is 14 x 14 x 40 ft. in hight and thence through 10 lead chambers, which have a space of 360,000 cu. ft. From the chambers the gases pass through three Gay Lussac towers which are 14 x 14 x 40 ft. All towers are packed with special chemical brick. Two hard lead fans are used for forcing the gases through the towers and chambers. The acid is pumped to the tops of towers by means of acid eggs and compressed air. Large steel storage tanks are located convenient to railroad, and acid is loaded by gravity into tank cars.

There are four distillation furnaces, all of the Hegeler type, each containing 864 retorts of 8-in. inside diameter. The smelting capacity of each furnace is 20 tons. An improved Hegeler type of gas producer, 9½ x 22 ft., furnishes the necessary gas. The furnaces are placed parallel at 100 ft. centers, each building having a width of 70 ft., thus allowing ample space between furnaces for light and air. The building having been substantially built of steel, a sheet steel hood surrounds each furnace, thus affording extremely good ventilation for the workers. Counterweighted doors are used between hood and working floor after the campaign has been completed. The waste gases from the furnace pass through a 588 hp. Rust vertical tube boiler and thence to a Radial brick stack, 125 ft. high, built by the Heine Chimney Company of Chicago, with an inside diameter of 6 ft. at the top. Each boiler is equipped with a firebox for direct firing, in case of the shut down of a furnace.

Retort annealing kilns are placed at the end of furnaces. Down-draft kilns are used with flues connecting with the large radial stack. Each furnace is equipped with a No. 6 Sirocco fan of 27,000 cu. ft. capacity against a pressure of 5 in. of water. An air main extends longitudinally over the furnace with branch pipes leading to both sides of furnace, ports being between each section of 24 retorts. A particular feature of the furnace is the flat roof

arch laid at the same slope as the retorts. The buckstaves are connected with tie rods through springs, thus allowing for the usual expansion. The bottom of the buckstaves have ball and socket joints, allowing movement in any direction. Another variation from the usual custom is that a large pocket is directly under the furnace, allowing room for the accumulation of several days' residue. A tunnel under this pocket allows the easy removal of residue. This arrangement of tunnel and pocket eliminates all possibility of up-draft in front of the furnaces. Each gas producer has a massive reinforced concrete bin over it, capable of holding a 15-days' supply of coal, which is fed by gravity into the producer.

THE POWER PLANT AND POTTERY

The power plant is contained in a steel and brick building, 43½ x 120 ft., and is equipped with a General Electric 2000 kw. turbine and also with two Ingersoll-Rand air compressors. Alternating current is used throughout the plant. Steam for the power plant is supplied by waste heat boilers by an overhead line. The machine shop is a brick and steel building, 90 x 160 ft., to which special attention was paid in order to secure maximum light and ventilation. There are windows on all four sides of the machine shop building and also in the roof. The machine shop is equipped with a full line of iron working tools and at one end are located complete carpenter and pattern shops.

The pottery is a substantial brick and steel structure, 60 x 142 ft., conveniently arranged for building material. The drying rooms are located on both sides of a main alleyway. Another alleyway is at each end of the rooms, the latter being used for loading retorts and condensers into cars. The rooms are heated by steam pipes under grated floors, air being driven by a large Sirocco fan. The air from the rooms is taken out through galvanized air ducts. The clay is worked through the usual dry and wet pans. A Wettengel pug mill and hydraulic press are used for retort making and a Garrison machine is used for condenser making.

The company makes only two products, zinc and sulphuric acid, having a capacity of about 50 tons of zinc per day and about 100 tons of sulphuric acid. Its entire product is sold to domestic consumers but the company has made a few foreign shipments. The entire works were designed and built by N. L. Heinz, general manager. Mr. Heinz is also the designer and erector of the huge acid plant of the Duckton Sulphur, Copper & Iron Company, Ltd., of Isabella, Tenn., where blast-furnace gases are used. Archibald Jones is general superintendent and J. W. Geib, assistant superintendent.

THE TOWN FOR EMPLOYEES

When the works at Langeloth were established they were built on farm land and there was no means of taking care of employees of the company except in building houses for them. This was done, and the company has established, just west of the factory site, a new town known as Langeloth, where some 60 to 70 houses have been built and are occupied by its employees. Some new ideas in construction in the building of these houses were carried out. They are built of different designs so that there is no monotony in their appearance. A new feature in the detail of their construction is the use of sheet zinc placed outside the sheathing, instead of paper, thus affording a lasting material, which is windproof, vermin proof and damp proof. Tinning strips are nailed on the studding over the zinc sheets and metal lath outside of this, on which is placed concrete stucco plaster. The houses are roofed with red slate imbedded and shingles which add much to their appearance. Some of the houses are five rooms and others seven rooms, and they are neat and equipped with modern appliances. Water is furnished from the company's own supply, and natural gas and coal are used for fuel. It is probable the company will build a large number of houses as soon as contemplated plant additions have been made.

Practical Co-operation in Foundry Work

The Philadelphia Foundrymen's Association held its monthly meeting at the Manufacturers' Club, in that city, Wednesday evening, May 5, having as its special guests the officers and members of the Associated Foundry Foremen of Philadelphia and vicinity. Paul E. Poindexter, of the reorganization committee of the Greater Chamber of Commerce of Philadelphia, addressed the meeting and after explaining the plans under which the new organization proposed to operate urged the foundrymen to become members.

William H. Barr, president of the Lumen Bearing Company, Buffalo, who is president of the National Founders' Association, made an interesting address on "Co-operation in the Foundry." It behooves every foundryman, he said, to devote time and energy to the betterment of working conditions. Something must be done to stimulate foundry labor, both skilled and unskilled. Manufacturers will have to deal in the next few years with a shortage of unskilled labor. The influx of foreign labor, following the war abroad, will be smaller. Foundrymen should look forward to this condition and prepare in advance. Methods and machinery should be installed to bring out maximum production with a minimum of labor. The installation of modern foundry equipment will go a long way toward solving the problem. Team work in daily foundry operation, not only in the individual organization, but also with associated foundrymen, will do much.

Reference was made to the constructive work of the National Founders' Association, particularly on lines of safety and sanitation. Hazards have been reduced, and the work has been made more agreeable. The standardization of goggles, leggings, foundry shoes, safety guards on machinery, etc., has aided materially in minimizing foundry accidents.

The treatment and education of apprentices were touched upon; also uniform legislation relating to the conduct of the foundry, maintenance of order in and about the foundry, the foundry store and scrap castings. Mr. Barr recommended closer co-operation between the shop foremen and the sales forces. Much can be accomplished by meetings of the department heads and sales forces. The game should be studied from all angles, so as to get out of the old low-capacity rut and build up a clean, profitable business on a sound basis.

Following the meeting a planked shad luncheon was served, at which informal addresses were made by various members and guests.

The Jeffrey Mfg. Company, Columbus, Ohio, announces the removal of its New York branch from 77 Warren street to 50 Dey street, adjoining the Hudson Terminal. In its new quarters the company proposes to carry the largest combined stock of its kind in New York City, consisting of power transmission machinery and elevating and conveying appliances. A large engineering and sales force will be maintained with ample facilities for handling promptly inquiries and orders. George H. Mueller, assistant sales manager of the Jeffrey Company, is the manager in charge of this office.

The steel plant of the International High Speed Steel Company at Rockaway, N. J., is nearing completion, and it is expected it will be in operation by the latter part of June. The product will be tool steels, alloy steels, high speed steels of various shapes, solid octagon and cruciform and hollow hexagon and round rock drill steels under the Bulldog brand.

The Electric Melting of Ferroalloys

A Description of the Wile Electric Furnace with a Statement of Costs for Premelting Ferromanganese and Ferrochrome

The advance in the price of certain ferroalloys and the uncertainty as to future supplies caused by war conditions, with the consequent necessity of using stock economically, were emphasized by R. S. Wile, president of the Wile Electric Furnace Company, in a paper before the Society of Iron and Steel Electrical Engineers at Pittsburgh Saturday evening, May 1. Mr. Wile's subject was "The Electric Furnace and the Melting of Alloys." He claims that melting the ferroalloys before adding them to the ladle or the furnace results in a saving of the alloy and an improvement in the steel, avoiding segregation by more thorough distribution. We quote from the paper:

"A condition which occurs in most steel plants is a variable supply of power due to the electrical equipment being used intermittently. A furnace of the slag resistance type can be used to good advantage for melting ferroalloys during these periods of idleness as it can be retarded or advanced at will without serious damage other than delaying the melting of the alloy, but as the composition of the alloy does not change during melting it does not affect the material in the least to keep it in the furnace longer, the only inconvenience being in the instance of several furnaces being ready to tap in quick succession in which event it is necessary to draw heavily upon the power supply. The advantage of melting the alloys is apparent in almost every instance, but more particularly where large additions must be added to the ladles, causing a decrease in the temperature of the steel, often rendering it necessary to tap the ladle before the additions are thoroughly distributed and trapping quantities of gas.

THE WILE FURNACE DESCRIBED

"The Wile electric furnace is of the three-phase type, one bottom and two top electrodes. The spacing of the electrodes is such that they compose as nearly as possible an equilateral triangle. To start, the two top electrodes are lowered to the floor of the furnace, some granular graphite or plumbago is sprinkled in, and when this glows the slag making materials are added. These vary with the material, but window glass is used for most purposes as it is neutral to most of the metals to be melted. As this melts the electrodes are raised until the proper hight is reached, and the alloy is then charged into the furnace and is melted beneath the slag from the heat of the bath and not from the direct heat as in the case of the arc furnaces. The current comes direct from the transformer to the furnace, the heat being regulated by the depth of the electrodes in the slag.

"When the metal is melted it is either poured into an auxiliary ladle and then poured into the steel ladle or the entire electric furnace is picked up by the auxiliary hoist of the crane and the furnace poured as if it were a ladle. The slag stays in the furnace to be ready for the next heat. It retains its molten condition for a considerable length of time, which enables the power to be quickly picked up again. If the furnace is used as a ladle it is set down by the auxiliary before the big ladle is poured and is either picked up by another crane and put into place or kept where it is until the ladle is poured and then replaced. This latter course, however, dissipates a good deal of valuable time and is not conducive to the highest efficiency from the furnace.

"The advantages derived from introducing the alloy in a molten condition, other than those of distribution, etc., may be questioned by many. I refer to the saving of metal effected. The percentage of saving varies with the amount of manganese, etc., added to the steel. As is well known a large part of the manganese added to both open-hearth and particularly Bessemer steel is lost in freeing the steel of oxides, and the amount of manganese oxidized is less with a high carbon than with a low carbon steel; it decreases with the amount added. Thus, if 1 per cent. manganese be added to the bath 0.60 per cent. will be found in the steel (less 0.40 per cent.); if 0.60 per cent. be added, the steel will retain 0.40 per cent (less 0.20 per cent.); the loss in one case being 40 per cent. and the other 30 per cent., and there is no assurance that all parts of the steel will show 0.60 per cent. or 0.40 per cent., as the case may be. The function of the manganese then is twofold, one to reduce the oxides, but mainly to strengthen the steel. But tests and practice have shown that by adding the manganese while molten the losses shown above do not occur so heavily and that a larger percentage of the manganese is retained in the steel. The saving is often as much as 35 per cent."

RESULTS FROM MELTING 1000 TONS OF ALLOY

Mr. Wile then quoted from an article by Felix Schroeder, of Livet, France, giving the results of melting over 1000 tons of ferromanganese to be added to converter steel. The results were obtained with a Keller furnace at the Burbacherhütte in Saarbrucken, Germany. The report states:

"The continuous operation of the converter plant during the six weekdays required an uninterrupted running of the electric furnace in order to have hot ferromanganese ready whenever needed. On Sunday the metal usually remained in the furnace and was maintained fluid by the electric current, the consumption of electric current for this purpose being 'very low.' When no electric power was available the furnace was emptied and restarted on Sunday night. During the week the furnace was never emptied. Small repairs were made on Sunday, the hot metal meanwhile being poured into a ladle.

"The longest period during which the furnace was used for melting ferromanganese was three months. During this time the roof of acid brick, which had already been used before during a period of steel refining, was neither repaired nor renewed. The dolomite lining was not renewed, and only a few small repairs were made from time to time. After these three months of melting ferromanganese the furnace was started to run on steel again, and the lining was still in fair condition. The roof and lining of the furnace, when used for melting ferromanganese, therefore, last at least three months. A lining of magnesite would stand from six to nine months in continuous operation.

"From the results obtained at the Burbacherhütte, the following conclusions may be drawn:

"1. The remelting of ferromanganese in the furnace occurs without any losses of manganese by volatilization. For example, 10 average samples of solid ferromanganese averaged 80.29 per cent. manganese before being charged into the electric furnace. Thirty-seven successive samples of molten ferromanganese taken from the electric furnace averaged 80.22 per cent. manganese.

"2. The net saving due to the use of molten ferromanganese amounts to 35 per cent. of the amount of solid ferromanganese which would be necessary for the production of steel of the same quality and under the same conditions of operation. Another saving results from the fact that all the fine pieces of ferromanganese, which are usually lost in ordinary practice, can be used up. It is even possible, if the addition of ferromanganese is made in molten form, to reduce slightly the manganese content in the finished steel without affecting the rolling quality.

"3. Costs of melting based upon a price of ½c. per kw-hr. were approximately $5 per ton of ferromanganese, including electric power consumption, elec-

trode consumption, wages, linings, and repairs. These are not the costs of special experiments, but a monthly average, and therefore include costs of heating and starting the furnace, delays, interruptions due to electrode changes, Sunday work, etc., or, briefly, all the expenses of using the process in a commercial basic converter plant.

"The distribution of molten ferromanganese in the ladle is uniform, the deoxidation quick and more effective, and rephosphorization impossible. Not only is the quality of the steel improved, but the capacity of the converter plant can also be increased since the time required for the resting of the metal to permit the ferromanganese to dissolve is saved. The gain per heat is always a few minutes, which amounts to considerable when running at full capacity."

RESULTS WITH THE WILE FURNACE

Commenting on his own investigations Mr. Wile said:

"We have carried out extensive tests to prove that there is no change in the alloy while melting and to show the carbon and power consumption as well as the cost of linings in our furnace for this purpose. We have come to the following conclusions, using 80 per cent. ferromanganese as a basis: That the average power consumption is nearly 800 kw-hr. per ton; that the carbon consumption is never over 12 lb. per ton and rarely that, and that the lining cost is between 10c. and 25c. per ton, depending upon the rapidity of melting. This means that the cost with power at ½c. per kw-hr. and carbon at 4c. will be between $4.50 and $4.75 per ton, exclusive of labor, which is incidental to the plant anyhow. This will add to the cost of the average steel between 3c. and 10c. per ton—a very small amount, which is easily dissipated in the reduced handling.

"Another point of saving is in closer calculations of the manganese. If the specification calls for 1 to 1.25 manganese the proper amount can be melted to yield the 1 per cent. in the steel, thereby saving the 0.25 per cent. The results in melting this alloy in a Heroult furnace at Joliet are such, I understand, that the cost of the steel is reduced 2/100 of 1c. Other data show that the power consumption in this type of furnace is 1256 kw-hr. per ton, and the electrode consumption $1.68 per ton based on carbon at 4c. per lb. This is a higher cost than shown either in the Keller or our furnace, but may be accounted for by the large size of furnace and the small amount of alloy melted causing a greater radiation. Even at this higher figure the cost of the steel is reduced rather than raised, and a better steel results.

SAVING IN FERROCHROME

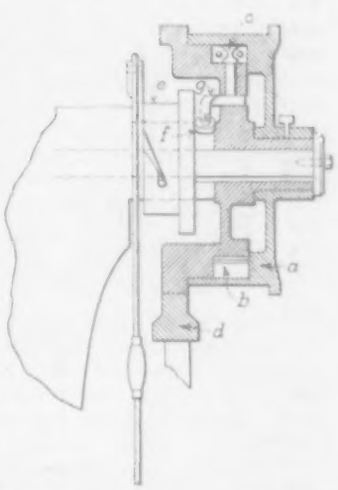
"Most of these remarks have been confined to ferromanganese, but the saving in ferrochromium is easily greater, as this alloy is now charged into the steel while in the open-hearth where the loss is greatly increased. Without an electric furnace it is necessary to do this owing to the high melting point of the alloy and the impossibility of its becoming melted by the time of pouring the ladle. It is truly wonderful to contemplate the saving possible by pre-melting this alloy.

"It has been contended by some that the best practice is to add these alloys to the furnace rather than to the ladle, maintaining that the furnace is the best place to make the steel, owing to the gases arising from the ladle causing spongy steel. This latter contention is undoubtedly true where the alloys are charged cold and may be to some extent if they are charged hot, as it does even when they are added to the furnace itself, but when it is considered that the loss of manganese or chromium goes on at the rate of about 12 points per minute while in the furnace it is doubtful if these gases, which are always present, are more costly in the end than the loss encountered from the waste of alloys. It is my contention that the loss of alloys is far greater than that encountered by the small amount of gas generated by adding the alloys in a molten condition to the ladle."

The Wile furnace is also being used by the Westinghouse Electric & Mfg. Company in melting nickel-iron for casting grid resistances, where it is necessary to keep the high graphite content in the iron to maintain its toughness and to have the specific resistance of one heat similar to that of another. Another practical application is in melting cobalt for making stellite.

A Friction Clutch for Power Hammers

Beaudry & Co., Inc., 141 Milk street, Boston, Mass., are equipping their Champion power hammers which were illustrated in *The Iron Age*, November 5, 1903, with a motor drive. In this way it is possible to use the hammer where the blacksmith shop is located at some distance from the main power plant or there are objections to the use of overhead shafting. In connection with this drive a special friction clutch pulley has been designed.



A Friction Clutch That Has Been Developed for Use in Connection with Electric Motor Driving of Power Hammers

The clutch consists of eight parts, including the washer on the end of the shaft which holds the pulley *a* in place. The friction ring *b* is split to fit over the head of the expansion pin *c*. This ring is slotted, and the sides of the slot are faced with steel with a view to providing a good wearing surface. The brake section *d* is fastened to the shaft with keys, the pulley running loose on the brake hub. The bearings of the pulley are lubricated by a grease cup. A spiral form cam, *e*, is kept in the neutral position by a spring located on the frame. A hardened steel roller, *f*, runs in a slot in the lever *g*. Adjusting screws and check nuts are provided for the expansion pin, this arrangement being relied upon to permit the washer and the sliding pulley back to be removed to make such adjustments as may become necessary from time to time.

The clutch is controlled by a foot treadle which operates through the lever at the left of the drawing. When the treadle rod is pulled down by pressure on the treadle the expansion pin *c* acts through the lever *g*, the roller *f* and the cam *e* to tighten the friction ring *b* between the pulley *a* and the brake *d*. With this arrangement the force of the blow is directly proportional to the amount of pressure applied to the treadle. The brake is automatically released when the hammer is in motion.

The motor used is mounted on a bracket fastened to the hammer frame. The maximum speed that can be used is 900 r.p.m., and a belt tightening attachment is used to give the required tension.

Milwaukee is given credit for accomplishing wonders in the reduction of industrial accidents, in a bulletin on industrial safety just issued by the Industrial Commissioner of Wisconsin. The bulletin says many accidents that have come to its notice show that it is only by efforts of the employee that such accidents can be prevented. One manufacturer reduced accidents in his establishment 75 per cent in the first year that he carried on a campaign of education. The average reduction for Wisconsin is given as ranging from 30 to 60 per cent.

ELECTRIC APPARATUS RECORDS

System for Securing Data on Performance and Repairs in Steel Plants

In discussing a paper* on the "Repair and Depreciation of Electrical Apparatus," presented by G. E. Stoltz, at a meeting of the Association of Iron and Steel Electrical Engineers, held at Pittsburgh, March 6, 1915, J. F. Kelly, of the electrical department of the National Tube Company, McKeesport, Pa., spoke as follows:

"The continuity of operation to-day in the steel mills depends largely upon the successful performance of the electrical apparatus and it is most essential that the equipment be prepared at all times to deliver the energy required of it. In order that the necessary steps may be taken to apply the proper remedy, it becomes necessary for the adoption and application of such methods and systems that will bring to the attention of the proper authorities, in the shape of records, the excessive attention required, the high cost of repairs and maintenance, and the loss of production, which may be caused by inefficient or defective apparatus.

"Each of the most important parts of the generating equipment should be assigned a card, upon which is entered a record of all inspections, repairs and renewals, and from which could be obtained a record of the performance of the principal parts of the different apparatus.

"Wherever practicable, it is our practice to use cards that can be filled in by the men directly in charge of the work, and the card need only be referred to the proper executive and then filed, thus reducing clerical work to a minimum.

RECORDS KEPT OF MOTORS

"We will describe, as clearly as possible, the cycle in which a motor moves from the time it is ordered from the manufacturer until it has been disposed of or becomes obsolete. Upon the receipt of instructions to procure a motor, we fill in a form which contains specifications for each part of the apparatus. This, together with a requisition, is forwarded to the proper authorities for approval.

"When the motor is received from the manufacturer, the record which is to be the permanent one is started. It consists of a wallet, 1 in. thick, 5 in. deep, and 7 in. wide, upon the face of which is marked all data, including date of installation, location, service, curve drawing, ammeter record, etc. The wallet is then placed in a file, properly indexed, and records of all repairs and renewals are filed in this wallet during the whole time this motor is carried as plant equipment.

"When replaced, the component parts of the motor, including armature, commutator, field coils, brushes, bearings, etc., are followed by a card on which is given all necessary data, date of last similar breakdown, cause of breakdown, suggestions of repairman and foreman as to what should be done to avoid similar breakdowns in future, and before the record is filed away, a statement of what actually was done to remedy conditions is made on the card.

"The defective part is forwarded to the repair department and the card to the office where duplicate records of each complete motor are kept, one being indexed and filed according to type of motor. The other is indexed under the name of the inspector in charge of the section in which the part failed, thus giving a record of the service of the different types of motors, also the number of breakdowns under each inspector.

"The record thus obtained is readily accessible and will give a complete history of each motor installed as well as its component parts, which can be tabulated in any desirable way either by size, type, service, etc.

CRANE SERVICE RECORDS

"Our method of keeping records of electrical cranes consists of each crane being assigned cards in duplicate on which are recorded the location, date of each thorough inspection, name of crane operator, and the condition of the different parts of the crane. After each regular inspection the original card is sent to the superintendent, who carefully scrutinizes the report as written in by the inspector, and points out with red pencil the items which are to be given immediate attention from a standpoint of safety. These cards, on each of which is the record of several previous inspections, appearing regularly and automatically on the superintendent's desk tell their own story whether the crane is giving satisfactory service and soon become valuable for reference. It is immediately seen whether repairs have been made which were previously reported as being necessary. The duplicate card is sent to the foreman who has charge of the crane. This record enables the foreman to promptly replace or repair any parts that have been reported as defective.

"Where delay seriously interferes with production, we have the craneman of this particular crane fill out and sign each day a card, giving location of crane, date, delays, cause, and remarks.

"At the end of the month a tabulated report is made showing the number of hours worked, number of hours delayed, cause of delays, etc. Some cranes have averaged a percentage of delay against number of hours worked as high as 1 per cent. and as low as 0.49 per cent.

SYSTEM USED IN ELECTRICAL REPAIR SHOP

"Every electrical repair shop should have a system of ascertaining the cost of repairs and renewals, and the most important object to be obtained in such a system is simplicity. It should be easily understood, economical in operation, and its importance to the whole organization must be recognized.

"The following is a brief description of our method of keeping shop records:

"Repair orders are made in duplicate and sent to the department office where stocks are checked for the material required to prevent free stock from accumlating, proper symbols for labor and material charges are inserted, and necessary approval is obtained, after which the order is sent to engineering department to fill in all necessary engineering information. The order is then given a shop job number. One copy is retained on office file, the other is sent to shop foreman.

"A time card in duplicate is issued on which is entered all necessary information—number of pieces to be manufactured, pattern numbers of castings, symbols for labor and material charges, and the required date of completion. Original card is pinned to the original copy of the order and forwarded to the shop foreman for execution, who then orders all necessary material, files his card in a tickler, allowing enough time after card automatically turns up in which to complete the work. On the wall is a board with pockets which have numbers on them corresponding to the numbers of the shop machines. Time cards are numbered to correspond to the machine numbers and deposited in these pockets. When workman has finished one job and is ready for another he has but to go to the board and the card which is in the pocket corresponding to the number of the machine which he is operating is his next job. Blueprints being ready he enters on the card his name, check number, operation, time started, and when through with the job he enters the time completed and deposits the card in the foreman's office. The foreman approves it and forwards it to the time clerk's office, where it is filed under job orders.

"The plan described serves to show the amount of labor performed, and the flat cost of the labor necessary for each job can thus be obtained. The data which we obtain from these records becomes valuable reference and enables us to overcome many of the difficulties which affect the operation of the various apparatus in use.

"When it is desirable to follow a particular piece of apparatus or a new equipment of any kind such as lamps, controllers, or other apparatus, a record is kept on which is given any repairs, renewals, or failures that may take place, thus obtaining an accurate record

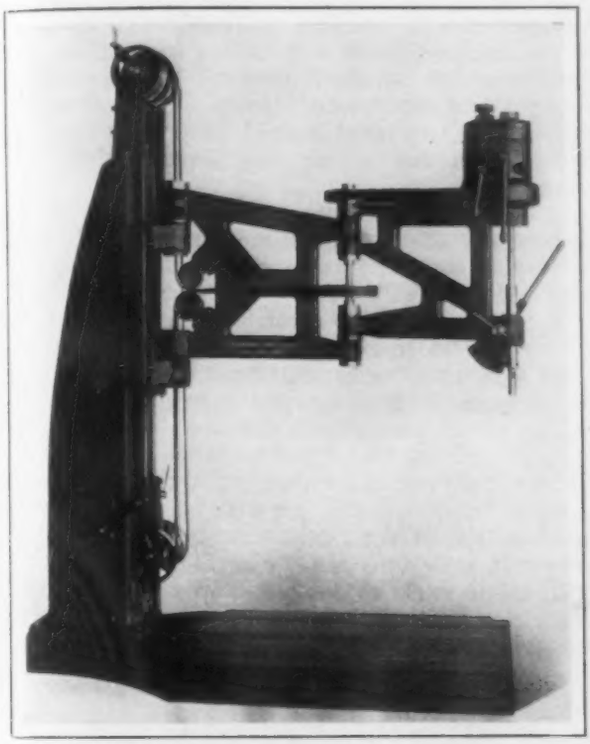
*Extracts from this paper were printed in *The Iron Age*, April 29, 1915, page 952.

of the performance of any equipment or apparatus that it may be desirable to follow.

"Proper records, accurately kept, and easy of access, are of inestimable value."

Vertical Swinging Arm Drilling Machine

The Almond Mfg. Company, Cleveland, Ohio, maker of a ball bearing high-speed post drilling machine which was described in *The Iron Age*, May 28, 1914, has mounted the same type of machine on



A Self-Contained Vertical Drilling Machine Having a Jointed Swinging Arm to Facilitate Bringing the Drill to the Point of Operation

a column and base. This makes it a self-contained unit for light drilling and tapping operations for use where a post is not available on which to mount the post type. The new machine has a base with three T slots in the working surface, which measures 34 x 48 in.

The saddle that carries the swinging arm is gibbed on the column ways. The swinging arm is double or jointed so that the drill can be brought directly to the proper position with a single motion, thus greatly increasing the speed of operation. Ball bearings are used throughout the machine. The saddle has a vertical adjustment of 2 ft. by an elevating screw and ball thrust. The maximum and minimum distances from the nose of the spindle to the base are 48 and 18 in. respectively.

The machine has a drilling radius of 4 ft. and will handle up to $\frac{7}{8}$-in. drills and $\frac{3}{4}$-in. standard taps. It may be driven from a lineshaft or from an individual constant-speed motor. Six changes of spindle speed are provided, ranging in approximately geometrical progression from 175 to 1000 r.p.m. The illustration shows the machine with a tapping head. It is also furnished with a plain head.

Henry R. Worthington, Inc., New York City, has been awarded the contract for a complete pumping plant for dry dock No. 1, Balboa Terminals, Balboa, Canal Zone. The contract involves the design, fabrication and delivery on the Isthmus of the structural, mechanical, electrical and hydraulic parts required for the installation, which is to consist of four main pumps, two drainage pumps and one bilge pump.

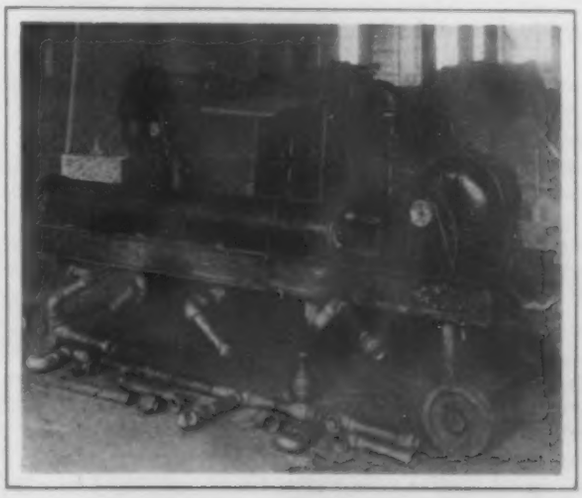
Internal Combustion Drier for Molds

The H. M. Lane Company, 707 Trussed Concrete Building, Detroit, Mich., is marketing a drier for large molds. This device is an adaptation of the Crawford internal combustion burner and is intended as a substitute for the practice of burning gas jets in the mold which is employed in regions where natural gas can be obtained. This process, it is pointed out, is slow, tends to burn certain portions of the mold and is not entirely satisfactory for deep pockets. Among the advantages claimed for the use of this device are that there are no ashes to handle or solid fuel to deliver, while, by reason of the relatively high pressure carried in the combustion chamber the hot gases can be delivered at points a considerable distance from the machine and the high velocity in the pipes minimizes the radiation losses and enables air to be forced into the pockets in the mold.

This drier consists of a standard 6-ft. burner, which is mounted on a structural base and provided with a pressure blower and gas connections. The blower is driven by a motor located on the end of the frame, the electric current being taken through a flexible cord from an adjacent electric light socket and controlled by the switch suspended from the air pipe in the center of the machine. Swaged couplings are employed between the blower and the relief valve, with a view to providing an air chamber to equalize the pulsation of the blower.

In operation the gas comes through the hose from the supply main and passes through the mixer, where air is added to it. From here it enters the burner pipes which pass into the top and bottom of the combustion chamber, as shown at the right of the large burner pipe. The gas from these pipes is burned in jets, the flames impinging against the auxiliary air pipe entering the end of the burner. This pipe has lateral nozzles through which auxiliary air is blown into the combustion chamber, with a view to reducing the temperature of the products of combustion. These and the auxiliary air pass down and out through four pipes 2 in. in diameter, to which are coupled a series of pipes to reach any part of the mold.

The flame is controlled to maintain the outgoing gases at a temperature of approximately 800 deg. F., and the high velocity in the pipe enables the hot gases to be delivered into large molds 15 or 20 ft. away from the blower. A mold 10 ft. wide, 18 ft. long and $3\frac{1}{2}$ ft. deep has been dried by this device overnight.



A Drier for Large Molds in Which an Internal Combustion Burner Is Employed in Conjunction with a Pressure Blower to Furnish the Heated Air Used

Heating an Open-Hearth Furnace by Tar

How War Conditions Caused Belgium's Largest Steel Plant to Use Coke-Oven Tar as a Fuel —A New Furnace Due to the Successful Results

BY ADOLPH GREINER

[Added importance and interest attach to this communication by Doctor Greiner to the annual meeting of the Iron and Steel Institute in London, England, this week, in view of the war's effect on Belgium's largest steel works, where these experiments were made—those of the John Cockerill Company, at Seraing, Belgium. The author is the head of this company as well as president of the institute.]

In the month of May last year, when I presented to the members of the institute a note on the by-products of modern metallurgy and dwelt on their actual or prospective utilization, I was far from foreseeing the unhappy circumstances—such as those from which we are all suffering at the present moment—which would compel the Cockerill Company to face the solution of a fresh problem of this nature. After the total stoppage of the works entailed by the foreign occupation and once the preliminary period of disorganization had passed, it appeared to us that we had a pressing duty before us—that of helping the working class around us to the utmost extent of our power to earn its livelihood. For this reason I decided at once to undertake the manufacture of a portion of the orders we carried on our books, so far as circumstances would allow.

SUPPLY OF GAS COAL EXHAUSTED

The steel works were thus compelled to contemplate the necessity of relighting an open-hearth furnace. Our reserves of gas coal had been speedily exhausted; the only battery of coke ovens which was working was unable to furnish us with gas, of which it was itself in pressing need; the importation of British coal was impossible and, as a matter of fact, we felt the need of freeing ourselves from the long established dependence of the works upon foreign countries as regards the supply of gas coal. There remained, as our sole resource, the tar from the coke ovens.

I had quoted last year some figures relating to the use of this fuel at the Gary plant of the United States Steel Corporation in the United States; that which others had succeeded in doing we likewise wished to do. Indeed, even as far back as last summer, experiments had been undertaken for heating by tar the little 12-ton furnace kept for our experiments, which had already been modified for the purpose of utilizing coke-oven gas. With this furnace the members of the institute are already familiar. These earlier experiments were carried out by employing injectors of a very rough kind, which were led in, one at each end of the furnace, in the axis of the port of delivery of the coke-oven gas.

An arrangement of this description allowed us, in the event of delay or stoppage, to have recourse, without loss of time, to the older form of fuel, which always remained available. Indeed, as a matter of fact, during this experimental period, I am compelled to admit that the inconveniences arising from the use of tar were numerous, and we only succeeded in finishing a few of the charges commenced with this fuel, without being compelled to fall back on the earlier method of heating. So much was this so, that when we found ourselves brought to a standstill for want of the coal which might have been used to feed some other furnace, the problem was a long way from having been solved.

Nevertheless the stimulus of need, added to the satisfaction that we promised ourselves of being able to do without foreign coal, decided us to employ this mode of heating by hook or by crook. It is not my intention to describe here the details of an installation so often modified and still less the succession of setbacks which neither rebuffed nor discouraged the engineer, Mr. Bourgy, who was in charge of the open-hearth furnace. I will confine myself to saying that not a single charge was lost. On the contrary, experience, even when unhappy, being a fruitful lesson, we arrived by successive modifications at furnishing this experimental furnace with sufficiently reliable appliances which have enabled me today to put before you a few figures resulting from practice that has become truly commercial.

EXPERIMENTAL RUNS ON A 12-TON FURNACE

These results relate to a campaign of ten weeks' work, from January 10 to March 20, 1915, undertaken in the furnace after repairs, and during which, apart from the intervention of Sunday, the only stoppage of work resulted from a delay in the deliveries of fuel (a detail which it is not always possible to control). Owing to various circumstances, the furnace was stopped at the end of 10 weeks after having produced, in 215 charges, a total of 1986 tons of steel of varying composition.

In the present arrangement the tar is delivered to the sprayers (one only in each burner) with a regular feed and under a uniform pressure of half an atmosphere. It is sprayed by means of air compressed at about three atmospheres. The hot air of combustion is admitted above the injector through the existing port, inclined at an angle of 45 deg. The average consumption of tar throughout the whole campaign has been 133 kg (300 lb.) per ton of steel, including in this figure the amounts required for lighting up and for heating during stoppages. On the other hand, with an uninterrupted run, this average falls to 115 kg (250 lb.) per ton of steel. The average weight of the charges had to be diminished in order to avoid any deflection of the jet of flame issuing from the pulverizer toward the crown of the furnace. Nevertheless, several charges of 15 tons have been worked successfully without any other inconvenience than a proportionately longer working time. The proportion of pig iron found necessary in the charge rose to 28 per cent.

I may add that, after these 215 charges, the furnace is still in an excellent working condition. The roof appears even less damaged than after a similar campaign with coke-oven gas; only the chambers became incrusted. The bricks of the

checker work became covered with a carbonaceous substance, and it will be necessary to devise some means of remedying this inconvenience.

A NEW FURNACE BUILT TO USE TAR

I wish to add that, as a sequel to the satisfactory results we are obtaining, we have built a new furnace of 25 tons capacity, furnished with appliances completely modified for the purpose of the exclusive utilization of tar as a fuel. This new furnace has been in operation since the beginning of April, and I hope that before the publication of the Journal I shall be able to give the results of fresh experience relating to it.

The following table affords a comparison of the different results of experiments obtained with this same small 12-ton furnace when working, as originally, with producer gas; with coke-oven gas

	Heated producer-gas +hot air	Cold coke-oven gas +hot air	Tar +hot air
Tonnage produced during campaign, tons	2624	3516	1986.5
Average daily production, tons	39	48	38
Average proportion of pig iron per charge, per cent	31	21	28
Average waste, per cent	5.5	4	4.8
Fuel consumption per ton of steel	300 kg. (650 lb.)	280 cub. met.[1] (9800 cub. ft.)	115 kg. (250 lb.)
Cost of heating per ton of steel[2]	8.40 francs $1.64	4.20 francs 81c.	4.60 francs 89c.

[1]This figure is difficult to determine accurately.
[2]This is based on the following:
1 ton of gas coal, including cost of gasification, costs 28 francs ($5.35).
1 cubic meter of coke-oven gas costs 1.5 centime (30c.).
1 ton of tar costs 40 francs ($7.78).

(after a modification of the chambers and of the burners); and, finally, when using tar, and without any further modification than the addition of the pulverizers.

Newark Foundrymen's Association

The Newark Foundrymen's Association, Newark, N. J., at its annual meeting, May 5, re-elected officers as follows: H. P. Macdonald, Snead & Co., president; James Flockhart, Maher & Flockhart, vice-president; James Campbell, Maher & Flockhart, treasurer; J. Smylie Kinne, Riverside Steel Casting Company, and the following as members of the executive committee: James Flockhart, Louis Sacks, G. Hannay, Oscar Barnett Foundry Company; A. E. Barlow, Barlow Foundry Company, and Denis F. O'Brien, A. P. Smith Mfg. Company.

In a brief address reviewing his administration President Macdonald said that a section of the machine-tool industry and the foundries supplying it with castings are enjoying an unexampled period of prosperity, but he believed that any boom based on war orders should be regarded conservatively as there is great danger of a reaction when the emergency is past. He pointed out that it would not be good for business if those buying so heavily at present exhausted their resources to an extent which would prevent normal purchasing after the war. He directed attention to the increasing activity of the association in legislative matters having a bearing on the trade and urged persistent watchfulness. At the close of his address the legislative committee of the past year was continued in office.

The meeting was addressed on foundry costs by Walter A. Staub, of the firm of Lybrand, Ross Brothers & Montgomery, accountants, New York, who discussed the several points involved in his subject in a manner that elicited the appreciation of the members. He emphasized that expenses which cannot be seen going directly into castings often amount to large sums and mislead the foundryman; also that individual study of every case should govern the placement of costs.

No. 1 blast furnace of the Ensley, Ala., group of the Tennessee Coal, Iron & Railroad Company was blown in last week. Only one furnace out of six at Ensley is now idle.

Southern Pig-Iron Rate Hearing

WASHINGTON, D. C., May 11, 1915.—After a preliminary hearing before Examiner Pugh, of the Interstate Commerce Commission, the case of the Sloss-Sheffield Steel & Iron Company against some 300 railroad systems throughout the country has been continued until June 14. The time to be occupied by the case cannot be approximated because of the extent and variety of the interests involved, owing to the almost universal distribution of Southern pig iron. In the language of Examiner Pugh, the case has developed into what is "practically a question of Birmingham rates to all local points north of the Potomac and east of the western boundary of central freight association territory."

The commission has permitted the intervention of a number of manufacturing corporations and associations of manufacturers, whose representatives testified on the opening day of the hearing, including David Evans, of the Chicago Steel Foundry Company; J. L. Roney, of the American Rolling Mill Company, Middletown, Ohio; C. P. Hackett, of the U. S. Radiator Company; J. F. Atwater, of the American Hardware Corporation, New Britain, Conn.; L. E. Mercer, of the Farrel Foundry & Machine Company, Ansonia, Conn.; John Sargeant, commission dealer in pig iron, Cincinnati; A. M. Campbell, of the Milwaukee Metal Trades and Founders' Association, and Wm. J. Breen, of the New England Foundrymen's Association.

The general purport of the testimony given by the representatives of the intervenors was that Southern pig iron is an absolute necessity in practically every manufacturing center; that existing rates, i. e., those which were not reduced in accordance with the intendment of the commission's original order in this case—are so high as to limit consumption, and that if reasonable rates were made, including water and rail rates to points in New England, there would be an even larger use of Southern iron than at present. Counsel for the Sloss-Sheffield Company dwelt with special emphasis upon the contention that existing rates limit the distribution and consumption of iron from the Birmingham district, while in the interest of both producers and consumers the tariff should be as low as the railroads with the most economical management can afford to make it.

The preliminary hearing developed the fact that the defendant carriers will undertake to show that existing rates on pig iron are disproportionately low as compared with other commodities and that since the decision of the commission in the 5 per cent. rate advance case was made conditions have justified an increase rather than a decrease in the rates complained of in the original Sloss-Sheffield case. W. L. C.

New Plant to Make Ferrosilicon

A plant for the manufacture of ferrosilicon and calcium carbide is to be built at Highlandtown, Md., on a site adjoining the property of the Pennsylvania Water & Power Company. It will be undertaken by the Shawinigan Electro Products Company, which has a capital stock of $250,000. The prime movers in the project are J. E. Aldred, chairman of the board, and Charles E. F. Clarke, president, of the Pennsylvania Water & Power Company, whose office is in the United State Fidelity & Guaranty Building, Baltimore. The new company will be allied with the Power Company, the latter supplying the electric power required. It is stated that this will be the first instance in this country of the operation of electric furnaces on a large scale from the current supplied by a hydroelectric plant to a location on tidewater.

New Heroult Furnaces

The Michigan Steel Castings Company, Detroit, Mich., has secured licenses from the United States Steel Corporation for the erection of a 6-ton and a 2-ton Heroult electric furnace. These are to replace steel converters.

The Electric Steel Company, Indianapolis, Ind., successfully put in operation last week its 3-ton Heroult electric furnace for the manufacture of steel castings.

FOREIGN TRADE STATISTICS

March Iron and Steel Exports and Imports

Through the courtesy of the Bureau of Foreign and Domestic Commerce of the Department of Commerce, our Washington correspondent has been enabled to furnish the following advance figures of our foreign iron and steel trade in March, 1915, compared with figures for the previous year:

Exports of Iron and Steel

	March		Nine months	
	1915, gross tons	1914, gross tons	1915, gross tons	1914, gross tons
Pig iron	7,263	11,043	73,716	164,336
Scrap	1,068	2,578	14,695	59,390
Bar iron	557	632	4,624	9,283
Wire rods	10,731	8,334	54,100	30,349
Steel bars	17,252	10,338	118,886	118,157
Billets, ingots and blooms, n.e.s.	26,410	4,235	81,705	29,931
Bolts and nuts	1,050	1,640	9,425	15,474
Hoops and bands	2,469	567	9,676	8,623
Horseshoes	1,387	125	7,414	945
Cut nails	75	583	1,431	3,187
Railroad spikes	673	652	4,369	6,072
Wire nails	3,756	2,674	33,788	28,150
All other nails, including tacks	555	224	2,976	2,390
Pipes and pipe fittings	.....	18,052	.....	188,243
Cast pipes and pipe fittings	1,720	.....	46,126	.....
Wrought pipes and pipe fittings	7,905	.....	75,404	.....
Radiators and cast-iron house heating boilers	122	276	2,159	4,614
Steel rails	11,420	25,196	94,403	282,681
Galvanized-iron sheets and plates	4,924	4,995	30,751	42,106
All other iron sheets and plates	1,365	489	5,980	8,962
Steel plates	9,069	15,256	73,833	131,663
Steel sheets	7,997	12,678	67,121	103,513
Structural iron and steel	16,943	20,550	118,976	245,813
Tin and terne plates	10,500	3,578	56,394	30,054
Barb wire	15,132	6,165	88,563	60,802
All other wire	13,926	9,138	82,900	63,548
Totals	174,269	159,998	1,159,415	1,638,286

Imports of Iron and Steel

	March		Nine months	
	1915, gross tons	1914, gross tons	1915, gross tons	1914, gross tons
Pig iron (including ferrosilicon	....	....	.....	*38,892
Ferrosilicon	592	659	24,922	†2,049
All other pig iron	2,385	10,677	79,891	52,997
Scrap	1,847	5,640	25,303	†14,555
Bar iron	634	933	18,202	9,177
Structural iron and steel	187	718	5,363	7,177
Ingots, blooms and steel billets	....	....	.....	*6,317
Steel billets without alloys	69	71	954	†2,259
All other steel billets	931	4,263	20,509	†16,750
Steel rails	430	637	15,691	10,422
Sheets and plates	161	341	2,317	1,843
Tin and terne plates	53	2,758	4,608	18,813
Wire rods	765	1,133	3,470	9,470
Totals	8,054	27,830	201,130	190,721

*July to October 3, 1913, inclusive. †Beginning October 4, 1913.

The exports in March of 174,269 tons of the commodities enumerated compare with 144,553 tons in February; 139,789 tons in January and 116,816 tons in December.

The imports in March of 8054 tons compare with 7505 tons in February; 10,569 tons in January and 9046 tons in December.

Panama Canal Traffic in March

Traffic through the Panama Canal in the month of March was approximately 40 per cent. greater than any preceding month. A total of 136 seagoing vessels passed through, carrying an aggregate of 635,057 tons of cargo, or 38 per cent. more vessels and 186,100 tons, or over 40 per cent. more tonnage, than had passed through in a preceding month. Tolls levied amounted to $606,316.56, bringing the total amount collected to date $2,971,675.29.

Of this traffic, 80 vessels, representing a tonnage of 417,610, were eastbound, and 56 vessels, representing a tonnage of 217,447, were westbound. Forty-six vessels carrying a tonnage of 194,856 were engaged in coastwise trade, a total of over one-third of the canal traffic. Of the cargoes, the largest single item was 111,025 tons of nitrates from the west coast of South America, the major portion of which was bound for the United States. Iron and steel manufactured goods, principally structural material, amounted to 20,884 tons, the bulk of which was shipped from the Atlantic seaboard to South America and the Pacific coast. Railroad material to the amount of 14,310 tons and 2506 tons of machinery passed through.

Lower Coal and Coke Rates to Catasauqua, Pa.

The Public Service Commission of Pennsylvania issued an order May 8 directing the Pennsylvania, Lehigh Valley and Lehigh & New England railroad companies to establish a through route for the transportation of coke and coal from the producing regions in Pennsylvania to the plants of the Lehigh Fire Brick Works, Bryden Horseshoe Company and the Empire Steel & Iron Company's Crane furnaces located at Catasauqua, Pa. The commission also ordered the companies to establish joint rates, as follows: Coke, from Gallitzin, $1.65 per ton; from Latrobe, $1.85, and from Connellsville, $2.05. Coal, from Clearfield and Latrobe, rate group, $1.75; from Greensburg, rate group, $1.85, and from Westmoreland, rate group, $2.05. The route and rates are to become effective on or before May 17.

It was the contention of the complainants that they were required to pay unreasonable rates and were unable to compete with other industries. After purchasing the old Crane plant railroad, the Lehigh & New England raised switching charges from $2.50 per car to 50c. per ton. This meant an additional $100,000 per year expense to the Crane furnaces, and in December they were put out of blast. The furnaces will resume as soon as coke and other material can be secured.

Reading-Bayonne Company Changes

The Reading-Bayonne Steel Casting Company has sold its plant at Bayonne, N. J., to the Bayonne Steel Casting Company, which has elected the following officers: William D. Sargent, president and treasurer, and A. J. Passino, secretary. H. K. Pollard has been appointed sales manager and Charles Lidstone superintendent. The plant at Reading, Pa., has been acquired by the Reading Steel Casting Company. The officers of this company are: J. Turner Moore, president; M. G. Moore, vice-president, and H. M. Doty, secretary and treasurer. M. G. Moore will be sales manager and J. Douglas Genger superintendent. The Reading-Bayonne Steel Casting Company was formed by a consolidation of these same two companies December 1, 1911, by substantially the identical interests now in charge. It was capitalized at that time at $750,000 and the two plants had a combined capacity of between 800 and 1000 tons a month.

Industrial Education Surveys

An industrial education survey will be made of Cleveland this spring under the direction of Dr. Leonard P. Ayres, of the Russell Sage Foundation. A study is to be made of such trade conditions as demand and supply of labor, apprenticeship and educational needs of the worker. The work will be in charge of R. R. Lutz, of New York City. An industrial survey of the same type and scope is to be made in the city of Minneapolis, under the general charge of Dr. C. A. Prosser, secretary of the National Society for the Promotion of Industrial Education.

Large Increase in Our Merchant Marine

The increase in the American merchant marine from July 1, 1914, to May 1, 1915, is 1019 vessels of 680,155 gross tons, which is considerably larger than the increase of any previous year. Of this total 877 merchant vessels of 179,450 gross tons were built and officially numbered. The remainder was 142 foreign-built vessels of 500,705 gross tons which took American registry in that period.

Convention of Advertising Clubs

Chicago will be the scene of the eleventh annual convention of the Associated Advertising Clubs of the World which meets June 20 to 24. This great gathering of the dynamos of the business world to discuss common problems and to advance the banner of truth in advertising promises to hold a unique place in the events of the year.

President Wilson, war conditions permitting, will head the list of speakers. William Jennings Bryan, John H. Fahey, president of the Chamber of Commerce of the United States; Henry Watterson, George Horace Lorimer, editor of the Saturday Evening Post, and Arthur Brisbane are among others of national prominence who are to address the sessions. On the Sunday preceding the formal opening of the convention 50 business men of country-wide reputation will deliver lay sermons in Chicago churches.

New features include a conference of the teachers of advertising and another of the secretaries of advertising clubs. Departmental meetings of men in the several fields of work will give opportunity for a discussion of the problems of various phases of advertising, an arrangement which reflects the new freedom in business.

Amusements include a list of social functions for the ladies, a gridiron show to be staged by 150 Chicago men, and lake and automobile trips. At present, a whirlwind campaign is being waged by advertising clubs in an effort to mobilize in Chicago at full war strength.

Stove Founders' Defense Association

The Stove Founders' National Defense Association held its annual meeting in the Hotel Astor, New York, on Tuesday, May 11. The meeting was largely attended, practically all the manufacturing establishments in the organization being represented. Officers were chosen as follows: President, George Mitchell, Pittston Stove Company, Pittston, Pa., re-elected; first vice-president, Lewis Moore, Moore Brothers, Joliet, Ill., re-elected; second vice-president, Joseph L. Anthony, Taunton, Mass.; treasurer, W. A. Dwyer, Peninsular Stove Company, Detroit, Mich., re-elected; secretary, Robert W. Sloan, Pittston, Pa. Thomas J. Hogan, who had served as secretary of the association for 25 years, having voluntarily retired, was elected an honorary member and presented with $2500 in appreciation of the splendid work he had done for the benefit of the organization. The new secretary is a practical stove molder, who has for the past six months been preparing for his new duties under the direction of Mr. Hogan.

National Pipe and Supplies Association

The sixth annual convention of the National Pipe and Supplies Association is being held this week at the Lafayette Hotel, Buffalo. The convention opened on Tuesday with over 200 of the members of the association and representatives of the large pipe making industries of the country in attendance. President W. M. Pattison, of the W. M. Pattison Supply Company, Cleveland, Ohio, occupied the chair. In opening the meeting he said: "We seem to be arriving at the dawn of a better day in the business world." A number of pipe manufacturers' representatives spoke at the opening session, taking an optimistic view on the market outlook. Among them were representatives of the Youngstown Sheet & Tube Company, National Tube Company and James B. Clow & Sons.

The Tobias Heater Company, Homestead, Pa., which has been incorporated to manufacture gas heating stoves, furnaces, burners and other gas appliances, has purchased the plant and equipment of the Homestead Heater & Mfg. Company, and is in position to proceed immediately with the manufacture of its lines. J. M. Tobias is president and general manager; James Ward, Jr., vice-president; J. Clyde Miller, treasurer, and H. P. Wiggins, secretary.

Customs Decisions

HAMMERING MACHINES ARE MACHINE TOOLS

The Board of United States General Appraisers has decided that hammering machines with all accessories, each equipped with a die stamp, are within the provision in the tariff act of 1913 for "machine tools" carrying duty at 15 per cent. The case before the board was that of Massee & Co., New York. The collector assessed the machines at 20 per cent. as manufactures of metal. It appeared from the testimony submitted at the hearing that the machines are used in the manufacture of jewelry chains, are operated by other than hand power, and work upon metal with the aid of cutting tools. The collector was reversed and a reliquidation ordered.

BALL BEARINGS

W. C. Carey, Buffalo, was overruled in claims for duty at 20 per cent. on completed ball bearings used in connection with shaft hangers. Duty was taken under the present tariff at 35 per cent. under the provision for ball bearings. Judge Fischer denied that the merchandise falls under the paragraph for manufactures of metal, and held the assessment properly made by the collector.

NIPPERS AND PLIERS

The board took adverse action in protests by Frank S. Betz & Co. and V. Mueller & Co., Chicago, against the collector's rate on forceps, clamps, tweezers, needle holders and like articles imported under the act of 1913. The importers' claim was for classification as metal manufactures with duty at 20 per cent. The board held that the collector's rate of 30 per cent. as "nippers and pliers of all kinds" was correct.

Few Equipment Orders in April

Railroad equipment orders in April were only 1165 cars and 18 locomotives, compared with 10,000 cars and 127 locomotives in April, 1914. It was one of the poorest months in 15 years, September and December of 1914 being smaller. From January 1 to May 1, 10,007 cars and 224 locomotives were ordered, these figures comparing with 41,500 cars and 486 locomotives in the same period in 1914. In all of 1913 the railroads bought 147,000 cars, and in 1914 the total was about 80,000.

The Cuba Railroad has ordered 10 ten-wheel type locomotives from the American Locomotive Company and the Pennsylvania Railroad has instructed its Juniata shops to proceed with the construction of 50 superheater Mikado locomotives. The French Government is reported to have issued specifications for 100 large locomotives, while the Western Maryland is inquiring for 10 locomotives and the Chicago Great Western for 5 switching locomotives.

Edgar M. Moore & Co., Pittsburgh, dealers in new and second-hand machinery, report a marked change in business conditions. Second-hand equipment has especially been much more active of late. In November, 1914, after a year's effort, the company sold one of two 750-hp. gas engines which it had in stock. The other was disposed of in April this year. Since then the company has sold two 110-hp. gas engines, a 1000-hp. gas engine, an 85-hp. gas engine, a 55-hp. gas engine with generator directly connected, two 400-hp. boilers, one 19 x 14-in. air compressor, one 150-hp. direct current motor, one 100-hp. direct current motor and a number of small motors, gas engines, air compressors and machine tools. The large gas engines were all fitted with compressors for natural gas pumping stations.

B. F. Jones, Jr., president Jones & Laughlin Steel Company, recently bought a site 40 x 75 ft., at the corner of Fourth avenue and Ross street, Pittsburgh, diagonally across from the Curry Building, on which he has started the erection of a 12-story office building. The George Hogg Company has taken the general contract and about 600 to 800 tons of steel will be furnished by the Jones & Laughlin Steel Company.

ESTABLISHED 1855

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War Possibilities

Horror and deep indignation have so filled the minds of the American people since Friday that there has been little disposition to think of business or how it is to fare. In the sinking of the Lusitania by a German submarine and the killing of scores of Americans on board, a challenge has been given not only to this nation but to our ideas of civilization and to what we have conceived to be the fundamentals of humanity. In the face of it there is the feeling of one entering upon a new and dangerous road, not knowing to what catastrophe it may lead.

From the beginning of the European war the possibility that the United States might be drawn in has been recognized, but it has always seemed remote. Now it has come nearer, and in looking squarely at it the nation has borne itself with calmness and restraint. Unlike that into which the peoples of Europe were plunged last year, a war in which the United States engages can only come when the whole people have decided there is no other way. Such a decision has not yet been made and there will be ample time to count all the cost before the last word shall have been said in the effort to save a peace with honor.

It is conceivable that Germany can make a situation in which the continuance of friendly relations will be impossible. Technically that situation does not exist today, but its practical existence, even without a state of war, can only be prevented by guarantees that the rights of Americans under the established rules of maritime warfare will be respected. It is hard to believe that those responsible for Germany's war policies can be altogether lacking in that "decent respect to the opinions of mankind" which in this country has been a controlling influence from the beginning of our Government.

The seriousness of the week's developments has brought nothing approaching panicky conditions on the country's exchanges. Business has become seasoned to the hardships of the war abroad. When that war broke it was demonstrated that the preceding months of conservatism, when industry was under the harrow, had prepared the country for the successful meeting of the problems of that trying time in ways that could not have been counted on in advance. On the New York Stock Exchange in the past week the depression of Saturday and Monday was followed on Tuesday by a recovery indicating plainly the confidence inspired by the President's speech at Philadelphia. The business of the country has been slowly taking one step after another toward greater soundness, and lately to the marvelous export trade balance has been added the promise of another enormous crop. Whatever is ahead, the condition today is one of growing business and financial strength. There may be a purpose, as has been alleged repeatedly, and in the past week more pointedly, to draw this country into Europe's war, so that it may not remain the only great power whose resources have been spared from exhaustion. But such a malign effort could only signify a degree of desperation that does not seem borne out by other factors in the situation.

It need hardly be said that the events of the week have set far forward the agitation for the immediate strengthening of our national defenses. They have also done much for that other movement, slower-paced but surely advancing, that is to give the American flag its place on merchant vessels, and thus leave no room for an issue as between enemies and neutrals in the warfare of the submarine.

The Iron Content of Lake Ores

The only startling fact contained in the annual compilation of average iron content of Lake Superior ores as shipped for the season is the sharp decrease in the content of the Bessemer ores of the Mesaba range. The full presentation for the ores shipped in 1914 has just been made by the Lake Superior Iron Ore Association, with comparisons running back to 1902.

The showings for previous years have confirmed what would naturally be expected, that in a lean year the tendency is to mine and ship only the richer ores, so that while the general trend is for the season analyses to show decreases year by year, in a year of light tonnage the decrease in average iron content is either less than usual, or gives way to a temporary increase. In the case of the Mesaba Bessemer ores, the 13,877,060 tons shipped in 1913 showed an average iron content, natural state, of 53.2644 per cent. In 1914 the tonnage dropped 42 per cent., to 8,075,955 tons, yet the average iron content decreased to 52.5751 per cent. This was a drop of 0.69 unit. That would be rather a large decrease if conditions were similar as to tonnage. To make the drop still more striking, there was a decrease in moisture from 11.1898 per cent. to 11.0121 per cent., so that the ore dried at 212 degrees would show a loss of 0.81 unit.

The Mesaba Bessemers stood entirely alone in this decrease. The old range Bessemers showed an increase in their average from 55.3237 per cent. to

55.3773 per cent., in keeping with the fact that shipments fell from 4,678,575 to 3,248,715 tons, suggesting that if the tonnages had been equal the iron content would have gone down slightly.

The Mesaba range showed a decreased iron content in its Bessemer ores only, the 19,584,395 tons of Mesaba non-Bessemer in 1913 containing an average of 49.3445 per cent. iron, natural state, while the 12,726,990 tons shipped in 1914 contained 49.5887 per cent., an increase of about one-quarter unit. The old range non-Bessemers showed just a trifle greater increase in iron content, the tonnage decreasing from 8,245,258 tons to 6,424,034 tons and the iron content increasing from 52.2179 per cent. to 52.5031 tons.

The decrease in the iron content of all Bessemer ores shipped, Mesaba and old range, was four-tenths of a unit, but this showing is altogether fictitious as a suggestion of what should be expected in some future year with a large tonnage all around, because the old range Bessemer ores are running regularly about two units higher than the Mesaba Bessemers, and the Mesaba tonnage decreased 42 per cent. in 1914 while the old range tonnage decreased only 31 per cent., this of itself acting to pull up the average of the total ores.

A similar influence operated to distort the showing as to the non-Bessemer ores. In these the old ranges are running about three units higher than the Mesaba, and as in 1914 the old range non-Bessemer tonnage decreased only 22 per cent. as against a 31 per cent. decrease for the Mesaba non-Bessemers, the average of all ranges in 1914 is made disproportionately high, coming out at 50.5663 per cent. against 50.1958 per cent. in 1913.

With these influences at work the result is that the 46,385,288 tons of Bessemer and non-Bessemer ores shipped in 1913 from all ranges (excluding, of course, low grade, silicious and manganiferous ores) showed an average iron content of 51.6311 per cent., while the 30,475,694 tons of 1914 showed 51.6115 per cent., a decrease of one-fiftieth of a unit.

It is evident that unless conditions change in other respects, the next year of large tonnage will show a material decrease in the average iron content of all ores, in keeping with the decreases that have occurred in the recent past. The Lake Superior Iron Ore Association's compilations begin with 1902, and in general it may be said that in the seven years from 1902 to 1909 the average annual decrease for all Bessemer and non-Bessemer ores shipped was six-tenths of a unit, while in the five years following, to 1914, the annual decrease averaged only one-tenth of a unit.

While this statement as to the extent of the decrease in average iron content of Lake Superior ores is technically correct, it is as a matter of fact meaningless with respect to the ores of the region, for the simple reason that Bessemer ores, no matter where one finds them in the Lake Superior region, or in what year they may be mined, are on an average richer by several units than the non-Bessemer ores, and the relative demand for Bessemer ores has been going down rather rapidly in the past 12 years, this change of course tending to pull down the average of all the ores. In 1902 no less than 65 per cent. of all the ores shipped was Bessemer; in 1909 the proportion had dropped to 45 per cent. and in 1914 the proportion was only 37 per cent. This change accounts for seven-tenths of a unit of the drop that has occurred from 1902 to 1914. In other words, if the Bessemer and non-Bessemer ores had not changed in iron content from 1902 to 1914, but the tonnage proportions as to Bessemer and non-Bessemer had changed as they did, the average iron content of all the ores actually shipped would have been seven-tenths of a unit lower in 1914 than in 1902.

Taking the non-Bessemer ores alone, they lost about four units from 1902 to 1909 and then lost a half unit to 1913, temporarily regaining nearly all the latter loss in 1914. The Bessemer ores lost three and a quarter units from 1902 to 1909, and half a unit since then. If it had been necessary to mine as large a proportion of the total in Bessemer ores in recent years as in 1902 the loss in average iron content of Bessemer ores would undoubtedly have been materially greater than has been actually shown.

Physical Examination Tested

A great manufacturing plant which employs a large percentage of alien workmen has had more than a year's experience with the physical examination of all employees and has found the system exceedingly valuable. It was anticipated that trouble would be encountered because of the ignorance of the men and their racial and religious prejudices. As is well known, the year has not been one in which the average employee would care to run the risk of losing his employment, and it might be argued that the system would have worked out less favorably had labor been in great demand. However, those who have been intimately in touch with the situation are convinced that there would have been no difference even had business been at the top notch. In the very beginning some objections were met. A few men refused absolutely to submit to the physician's examination, but in each of these cases religious reasons were given, and since that time the exceptions have acquiesced in the common view of the question.

As has been the experience of other companies, the examinations revealed weaknesses which were dangerous to the individuals examined and threatening to the owners because of the financial burden which might result under the workmen's compensation act of the State. In no case was a man discharged because of disability. With some the nature of the work has changed, and as this company has a pension system, certain men who had been employed for a long term of years are now receiving this form of reward. Those persons who, together with their families, will benefit in the long run because they have learned of hitherto unsuspected ailments would not be regarded as a very large factor, perhaps, in percentage of the whole force, but numerically this element is not inconsiderable.

A great many manufacturing companies are considering seriously the adoption of physical examination as a part of the regime at their plants. Generally speaking, workmen's compensation has not been an exceedingly great burden to owners as compared with its predecessor, employer's liability; but the legislative bodies of the various States are

making these laws more rigorous every year, and the future must be discounted. The man or woman who is physically unfit for the work he or she is doing will be weeded out. The average employer stands by his working people wherever it is possible for him to do so, and a great many of the physically incompetent will be cared for in some manner, especially when their records are good. It is considered only just that the owner should protect himself against a liability for damages which comes not from the nature of the employment but from the condition of the employee.

Machine-Tool Prices Advancing

The influence of the tremendous demand for munitions of war has extended to the prices of such machine tools as are required in the manufacture of projectiles, small arms and their ammunition, guns of larger caliber, and also a long list of general metal materials which are necessary in carrying on modern warfare. Certain types of machines remain at the old figures, including planers, shapers, the larger sizes of vertical drilling machines and the radials, as well as some classes and sizes of other machine tools. The volume of product already disposed of from stock or in process of manufacture, the price of which is from 7 to 10 per cent. higher than normal, in fact higher than most previous high records, is very great. The advance is not along any given line, but with such equipment as engine lathes of practically every size, grinding machines, sensitive drilling machines and so-called manufacturing drilling machines of similar capacity, cylindrical grinding machines in most classes, milling machines, profiling machines, headers, and on through the list of standard and special machinery, the tendency of prices is sharply upward. The suggestion is made that an important reason for this change is an unusual risk of cancellations of contracts; but such is not the case in a great majority of cases. The builders are protected by cash deposits in banks, deliveries being f.o.b. the factories or the docks of American ports. Domestic credits are easily ascertained, and with this class of business the non-cancellation clause can be insisted upon without danger of offense to the buyer. The change in values is due to the working out of the relentless law of supply and demand. No one can help being glad of this radical change in the machinery trade which has been through a series of lean years.

Warning Against an Imposter

The Allied Machinery Company of America, 55 Wall street, New York, cautions the trade that an individual posing as a representative of that company is endeavoring to obtain loans from machine-tool builders. His favorite method of operation is to telephone saying that he had been robbed of his funds and needs from $50 to $100 to travel to New York to catch a steamer or keep an important appointment in some distant city. The same individual has also operated in Europe and has victimized several machinery houses there.

The American Steel Foundries reports a net operating loss for the quarter ended March 31 of $76,485, against a profit of $17,102 in the corresponding quarter of 1914. After charges for sinking funds, bond redemptions, etc., the total loss for the March quarter of this year was $256,333, against a loss of $163,353 in the corresponding quarter of the previous year.

To Investigate Pittsburgh Ore and Finished Steel Rates

WASHINGTON, D. C., May 11, 1915.—That the Interstate Commerce Commission will not hand down its decision with regard to the freight rates on iron ore from Lake Erie ports to points in Pennsylvania, West Virginia and Ohio in time for a change in the tariffs during the season of navigation just opened is the opinion of the most experienced officials of the commission. It was the original intention to announce simultaneously the ruling on this case and on the so-called Lum case, involving freight rates on iron ore from the Mesaba and Vermillion ranges to upper Lake docks (decided two weeks ago), but it was recently found to be impracticable to do so. In dealing with the question of rates on iron ore from Lake Erie ports to Pittsburgh, Wheeling, etc., the commission has decided to investigate the subject most exhaustively because of the great importance, from a tariff-making standpoint, of commodity rates in the Pittsburgh district and contiguous territory.

The independent steel manufacturers have furnished a large amount of data tending to show that a rate of 50 to 60 cents is a reasonable charge from Lake Erie to the Pittsburgh and Wheeling districts and the carriers are now endeavoring to offset this evidence by demonstrating that the cost of handling this business has been greatly underestimated. The commission has indicated in this case that it will not approve rates that are intended to offset alleged natural advantages of one district as compared with another and it is probable that the decision will contain the most comprehensive utterance on this point that has yet been handed down by this body.

In addition to the chief issue in this case as to rates on iron ore from Lake ports, the commission is now considering the desirability of making a supplemental investigation, on its own initiative, regarding rates on finished products from the Pittsburgh district. It has been stated that if the commission will investigate the matter it will find that "there are such manifest discriminations against the Pittsburgh district in the rates on finished and semi-finished steel products, such as bars, billets, hoops, bands, nails, etc., that Pittsburgh is shut out of the Northwest market by rates favoring Cleveland and that its Southern market is materially affected by high rates to Cincinnati as compared with those from Chicago to that point." W. L. C.

Iron Ore on Lake Erie Docks May 1

Stocks of Lake Superior iron ore on Lake Erie docks May 1 were distributed as follows, comparison being made with the amount on docks May 1, 1914:

	1914 Gross tons	1915 Gross tons
Buffalo and Tonawanda	270,619	173,329
Erie	461,750	412,186
Conneaut	495,154	557,471
Ashtabula	2,187,621	1,955,733
Fairport	245,038	283,591
Cleveland	1,487,128	1,411,529
Lorain	245,058	377,545
Huron	308,479	455,608
Sandusky	2,471	2,471
Toledo	216,399	256,949
Total	5,919,717	5,886,412

The Bureau of Statistics of the American Iron and Steel Institute, 261 South Fourth street, Philadelphia, Pa., which is in charge of William Gray, has issued the annual statistical report for 1913. This report and the one issued for 1912 by the American Iron and Steel Institute continue the series for the 40 years preceding, which had been issued by the American Iron and Steel Association. The report for 1913 is a volume of 152 pages, in which is concentrated the statistical information relating to the American iron and steel trade which appeared in 10 special bulletins issued at various times in the course of 1914. The report also includes statistics of the Canadian iron and steel trade.

The Bessie Furnace Company, Columbus, Ohio, has increased its capital stock from $250,000 to $300,000.

Edgar Thomson Steel Works Improvements

In *The Iron Age* of June 6, 1912, mention was made of proposed important extensions and improvements to be made at the Edgar Thomson works of the Carnegie Steel Company, Bessemer, Pa. Since that time there has been finished a new open-hearth steel plant, containing fourteen 60-ton furnaces, a description of which was printed in *The Iron Age* of January 1, 1914. A new blooming mill has also been built with a capacity to roll sections for the three rail mills at the plant. In August, 1914, after the European war started, all extension work of the United States Steel Corporation at the plants of its subsidiaries was stopped, but this has gradually been resumed, and work is now proceeding in the building of a new rail mill at Edgar Thomson to take the place of the present No. 2 mill, on which sheet bars and light rails are rolled. This No. 2 mill was the original mill built at the plant, having been erected in 1872-3. The new mill, also to be known as No. 2, will have a capacity for rolling standard section rails up to 150-lb. This mill will be built by the Carnegie Steel Company itself, and the company will also build some new soaking pit furnaces. A new and well equipped storage yard is also to be added to take care of the increased output of the Edgar Thomson works. This yard will have overhead cranes, electric lifting cranes, depressed tracks, etc. It is expected to have the mill finished about January 1.

Statements that large additions are to be made to the Duquesne works of the Carnegie Company at Duquesne, Pa., are incorrect. This plant makes merchant steel bars and sheet bars. Some minor additions to equipment are being made to facilitate the handling of the output, but the capacity will not be increased.

The Pennsylvania Steel Company's Year

The Pennsylvania Steel Company has issued its annual report for the year ended December 31, 1914. The income account compares as follows with 1913:

	1914	1913
*Income from operations	$1,276,208	$2,764,141
Other income	63,841	69,520
Total earnings	$1,340,049	$2,833,662
Interest on bonded debt	1,116,455	1,017,341
Net income	$223,594	$1,816,320
Depreciation and sinking funds	902,086	1,186,676
Deficit (profit in 1913)	$678,491	$629,644

*After payment of all expenses of operation, including approximately $2,200,000 for ordinary and extraordinary repairs and upkeep currently charged during 1914 to cost of production, and $3,500,000 similarly charged in 1913.

The net income of $223,594 shown above is equal to 1.1 per cent. on the preferred capital stock, compared with 8.8 per cent. earned in 1913. It will be observed that after the appropriation of $902,086 for depreciation and sinking funds a deficit accrued of $678,491, against a profit of $629,644 in 1913.

Steel Corporation's Orders Decrease in April

The regular monthly statement of the United States Steel Corporation of unfilled orders on its books April 30, 1915, shows a total of 4,162,244 tons as compared with 4,255,749 tons on March 31, 1915—a decrease of 93,505 tons. On April 30, 1914, the unfilled tonnage was 4,277,068 tons. The following table shows the unfilled tonnage for each month beginning with the high point of December 31, 1912:

April 30, 1915	4,162,244	January 31, 1914	4,613,680
March 31, 1915	4,255,749	December 31, 1913	4,282,108
February 28, 1915	4,345,374	November 30, 1913	4,396,347
January 31, 1915	4,248,571	October 31, 1913	4,513,767
December 31, 1914	3,836,643	September 30, 1913	5,003,785
November 30, 1914	3,324,592	August 31, 1913	5,223,468
October 31, 1914	3,461,097	July 31, 1913	5,399,356
September 30, 1914	3,787,667	June 30, 1913	5,807,317
August 31, 1914	4,213,331	May 31, 1913	6,324,322
July 31, 1914	4,158,589	April 30, 1913	6,978,762
June 30, 1914	4,032,857	March 31, 1913	7,468,956
May 31, 1914	3,998,160	February 28, 1913	7,656,714
April 30, 1914	4,277,068	January 31, 1913	7,827,368
March 31, 1914	4,653,825	December 31, 1912	7,932,164
February 28, 1914	5,026,440		

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New Youngstown Sheet & Tube Company Coke Ovens and Other Improvements

The Youngstown Sheet & Tube Company, Youngstown, Ohio, has placed a contract with the H. Koppers Company, Pittsburgh, for 204 Koppers by-product coke ovens. These will be built on a site formerly known as the McCombs farm at Struthers, containing about 40 acres, and located near the four blast furnaces of the company. The daily capacity will be 2240 tons running on 18-hr. coke and 2600 tons on 15-hr. coke. There will be four batteries of ovens of the 12¼-ton cross-regenerative type, specially designed to handle high-volatile coal mixtures. The total cost will be about $3,000,000. It is expected to have the plant in operation in May, 1916. The question of benzol recovery has been left open for decision.

The Youngstown Sheet & Tube Company has also contracted with the McClintic-Marshall Company, Pittsburgh, for a railroad bridge requiring 600 tons of structural steel, and for an approach for foot and wagon traffic with the Pittsburgh Bridge & Iron Works. The full programme of improvements and additions to be made has not been completed, but will be ready in a short time. The company intends to add new finishing mills and probably take up some new lines of products, definite details of which will be ready in the very near future.

The Iron and Metal Markets

RUSSIAN RAILS AND CARS

Foreign Business Is Still a Large Factor

Domestic Demand Lagging in Spots — Shipments Exceed Orders

As yet the possibility of war has not proved disturbing to the steel trade. There are no cancellations or any other of the features that might be looked for in a grave crisis. The situation, in fact, holds the strength gained in the past two months. War orders and other foreign business have figured so largely in the industry of late that the chance of more war does not cause alarm. A first effect would be an increased home demand in some lines, and deliveries on foreign orders would suffer.

Russian rail and car requirements are of immediate interest. Contrary to reports, rail contracts have not been placed, but two steel companies expect to roll 30,000 tons each for Russia and the total purchases will be around 100,000 tons. Still larger amounts are talked of for the Trans-Siberian railroad.

Russian car orders have been definitely placed with two Canadian plants—2000 cars to each. At Chicago 8000 more are credited to a local company and 2000 to a Seattle car works. The 10,000 a leading steel car company is expected to get have not been placed.

In domestic railroad business one item is 10,000 tons of rails placed by the Rock Island; another is 6500 tons of tie plates by the Southern Pacific. Among car inquiries are 5000 for the Rock Island; but at Chicago no great encouragement to plate mills is yet found in car contracts. One such mill was only kept from a shutdown last week by an oil tank order from a Western line.

In the East interest is taken in the buying by a locomotive company this week of 9400 tons of 3½-in. rounds for shrapnel and 17,250 tons for high explosive shells. In southern Ohio an inquiry has come up for 20,000 tons of bars for similar work, and another maker is closing for 5000 tons.

The Pennsylvania Railroad rail inquiry for 138,000 tons includes 30,000 tons of 125-lb. sections which will be rolled by mills east of Pittsburgh. In these heavy rails the carbon limits are exceptional —from 0.74 to 0.94, giving a range of 20 points instead of 15 as usual.

Steel makers do not disguise their dissatisfaction with the volume of purely domestic business and the more or less precarious character of the foreign demand. At the same time it is pointed out that if a real railroad demand develops, the industry would soon be running to capacity.

The efforts to advance prices have met with varying success. Plate business is insufficient and prices suffer. In shapes there is still a lack of uniformity, and in recent structural lettings in the East, involving prompt delivery, the lowest prices of a year were made. In bars some uncertainty has come in, due to the concession of $1 a ton in the offer of a 1.20c. basis for the second half to the implement trade. Wrought pipe prices have not been improved by the recent announcements of advances.

A feature in structural steel is the contracts for quick erection of steel additions to plants having large war orders. One for the Baldwin Locomotive Works calls for 8000 tons of steel and two other large additions for like work have just been let in the East.

The National Tube Company has an order for 28,000 tons or 177 miles of 12-in. pipe for Louisiana oil interests. There has been closed also 28 miles of 20-in. pipe for gas distribution in the Pittsburgh district and a Wheeling district mill will furnish 55 miles of 8-in. screw pipe. Cast-iron pipe foundries are busier and have a good run of work ahead. Newark, N. J., has bought 4900 tons and Philadelphia will take bids on 12,000 tons.

Inquiries for fair amounts of billets have come from England to Eastern mills and a sale of Alabama blooms has been made there. Larger demand has developed at Pittsburgh for billets and sheet bars.

Shipments are still larger than new orders for most finished products. Some independent companies made a relatively larger inroad into unfilled orders in April than the Steel Corporation. Last week the Steel Corporation ran at 75 per cent. of ingot capacity, and this week's schedule represents a slight increase.

Pig-iron markets have quieted down after the heavy movement in April. The total of speculative buying runs up, as more details come out, an English brokerage firm being on the list for 25,000 tons of Southern iron. A firmer market for basic iron is indicated by a sale of 15,000 tons at $12.65 Valley furnace, deliveries extending over five months.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month and one year previous.

	May 12, 1915.	May 5, 1915.	Apr. 14, 1915.	May 13, 1914.
Pig Iron, Per Gross Ton:				
No. 2 X, Philadelphia....	$14.25	$14.25	$14.25	$14.75
No. 2, Valley furnace...	12.75	12.75	12.75	13.00
No. 2 Southern, Cin'ti...	12.40	12.40	12.40	13.75
No. 2, Birmingham, Ala..	9.50	9.50	9.50	10.50
No. 2, furnace, Chicago*	13.00	13.00	13.00	14.00
Basic, del'd, eastern Pa..	13.25	13.25	13.25	14.00
Basic, Valley furnace....	12.50	12.50	12.50	13.00
Bessemer, Pittsburgh....	14.55	14.55	14.55	14.90
Malleable Bess., Ch'go*..	13.00	13.00	13.00	14.00
Gray forge, Pittsburgh...	13.45	13.45	13.45	13.65
L. S. charcoal, Chicago..	15.75	15.75	15.75	15.75
Billets, etc., Per Gross Ton:				
Bess. billets, Pittsburgh..	20.00	20.00	20.00	20.00
O.-h. billets, Pittsburgh..	20.00	20.00	20.00	20.00
O.-h. sheet bars, P'gh...	21.00	21.00	21.00	21.00
Forging billets, base, P'gh.	**26.00**	25.00	25.00	25.00
O.-h. billets, Phila.....	22.02	22.02	21.52	22.40
Wire rods, Pittsburgh...	25.00	25.00	25.00	26.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia..	1.17½	1.17½	1.15	1.20
Iron bars, Pittsburgh...	1.20	1.20	1.20	1.30
Iron bars, Chicago.....	1.15	1.15	1.15	1.10
Steel bars, Pittsburgh...	1.20	1.20	1.20	1.15
Steel bars, New York....	1.369	1.369	1.369	1.31
Tank plates, Pittsburgh.	1.15	1.15	1.15	1.15
Tank plates, New York..	1.319	1.319	1.319	1.31
Beams, etc., Pittsburgh..	1.20	1.20	1.20	1.15
Beams, etc., New York..	1.369	1.369	1.369	1.31
Skelp, grooved steel, P'gh	1.12½	1.12½	1.12½	1.20
Skelp, sheared steel, P'gh	1.17½	1.17½	1.17½	1.25
Steel hoops, Pittsburgh..	1.25	1.25	1.25	1.25

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	May 12, 1915. Cents.	May 5, 1915. Cents.	Apr. 14, 1915. Cents.	May 13, 1914. Cents.
Sheets, black, No. 28, P'gh.	1.80	1.80	1.80	1.85
Galv. sheets, No. 28, P'gh	3.40	3.40	3.25	2.80
Wire nails, Pittsburgh..	1.55	1.55	1.55	1.55
Cut nails, Pittsburgh...	1.55	1.55	1.55	1.60
Fence wire, base, P'gh...	1.35	1.35	1.40	1.35
Barb wire, galv., P'gh...	2.10	2.10	2.10	1.95
Metals,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	21.00	21.00	17.75	14.37½
Electrolytic copper, N. Y.	**18.75**	18.62½	16.37½	14.12½
Spelter, St. Louis.....	14.00	14.00	9.75	5.00
Spelter, New York.....	14.25	14.25	9.87½	5.15
Lead, St. Louis.....	**4.10**	4.07½	4.12½	3.80
Lead, New York.....	4.20	4.20	4.20	3.90
Tin, New York.....	**40.00**	39.00	57.00	33.70
Antimony, Hallett's, N. Y.	**40.00**	35.00	32.00	6.85
Tin plate, 100-lb. box, P'gh	$3.15	$3.15	$3.25	$3.30
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt....	$1.50	$1.50	$1.50	$1.75
Furnace coke, future....	1.65	1.65	1.65	2.00
Foundry coke, prompt...	2.00	2.00	2.00	2.40
Foundry coke, future....	2.15	2.15	2.15	2.50
Old Material, Per Gross Ton:				
Iron rails, Chicago.....	11.75	11.75	11.75	12.75
Iron rails, Philadelphia..	**15.00**	14.50	13.00	15.50
Carwheels, Chicago	9.75	9.75	9.75	11.50
Carwheels, Philadelphia..	**11.50**	11.00	11.00	11.75
Heavy steel scrap, P'gh..	11.75	11.75	11.75	11.50
Heavy steel scrap, Phila.	**11.50**	11.00	11.00	10.50
Heavy steel scrap, Ch'go.	9.25	9.25	9.00	9.75
No. 1 cast, Pittsburgh...	12.00	12.00	12.00	11.50
No. 1 cast, Philadelphia.	**12.25**	11.75	12.00	12.50
No. 1 cast, Ch'go (net ton)	9.00	9.00	9.00	10.00

Finished Iron and Steel f. o. b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes. The foregoing rates to the Pacific coast are by rail. The rate via New York and the Panama Canal has no stability, being dependent on vessel charges.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.15c. base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ⅛ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ⅛ in. thick on edge or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras	Cents per lb.
Gauges under ¼ in. to and including 3-16 in....	.10
Gauges under 3-16 in. to and including No. 8....	.15
Gauges under No. 8 to and including No. 9....	.25
Gauges under No. 9 to and including No. 10....	.30
Gauges under No. 10 to and including No. 12....	.40
Sketches (including straight taper plates), 3 ft. and over	.10
Complete circles, 3 ft. in diameter and over....	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive....	.05
Widths over 110 in. up to 115 in., inclusive....	.10
Widths over 115 in. up to 120 in., inclusive....	.15
Widths over 120 in. up to 125 in., inclusive....	.25
Widths over 125 in. up to 130 in., inclusive....	.50
Widths over 130 in.	1.00
Cutting to lengths under 3 ft. to 2 ft., inclusive.	.25
Cutting to lengths under 2 ft. to 1 ft., inclusive.	.50
Cutting to lengths under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Wire Products.—Prices to jobbers. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots, annealed, $1.35; galvanized, $1.90. Galvanized barb wire and staples, $2.10; painted, $1.60. Wire nails, $1.55. Galvanized nails, 1 in. and longer, $1.20 advance over base price; shorter than 1 in., $1.70 advance over base price. Woven wire fencing, 72 per cent. off list for carloads; 71 off for 1000-rod lots; 70 off for less than 1000-rod lots.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.50	$1.55	$1.60	$1.65	$1.75	$1.85	$1.95	$2.05
Galvanized	2.00	2.05	2.10	2.15	2.25	2.35	2.75	2.85

Wire Rods.—Bessemer, open-hearth and chain rods, $25.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, 3 in. and over, 1.20c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in., on one or both legs.	.10
Angles, 3 in. on one or both legs less than ¼ in. thick as per steel bar card, Sept. 1, 1909.	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909	.20 to .80
Deck beams and bulb angles	.30
Handrail tees	.75
Cutting to lengths, under 3 ft. to 2 ft. inclusive.	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive.	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card in effect from May 1, 1915, all full weight:

Butt Weld

Steel: Inches	Black	Galv.	Iron: Inches	Black	Galv.
⅛, ¼ and ⅜	72	51½	⅛ and ¼	64	42
½	76	64½	⅜	64	42
¾ to 3	79	68½	½	68	52
			¾ to 2½	71	57

Lap Weld

2	76	65½	1¼	55	41
2½ to 6	78	67½	1½	66	52
7 to 12	76	65½	2	67	54
13 and 14	62½	65½	2½ to 4	69	57
15	60	65½	4½ to 6	69	57
			7 to 12	67	57

Reamed and Drifted

1 to 3, butt	77	66½	1 to 1½, butt	69	55
2, lap	74	63½	2, butt	69	55
2½ to 6, lap	76	65½	1¼, lap	53	39
			1½, lap	64	50
			2, lap	65	52
			2½ to 4, lap	67	55

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	67	54½	⅜	61	48
½	72	63½	½	66	56
¾ to 1½	76	67½	¾ to 1½	70	58
2 to 3	77	68½	2 and 2½	71	59

Lap Weld, extra strong, plain ends

2	73	62½	1½	65	53
2½ to 4	75	64½	2	67	54
4½ to 6	74	63½	2½ to 4	69	57
7 to 8	68	57½	4½ to 6	68	56
9 to 12	63	52½	7 to 8	61	51
			9 to 12	56	46

Butt Weld, double extra strong, plain ends

½	62	53½	½	56	45
¾ to 1½	65	56½	¾ to 1½	59	48
2 to 2½	67	58½	2 and 2½	61	50

Lap Weld, double extra strong, plain ends

2	63	54½	2	57	45
2½ to 4	65	56½	2½ to 4	59	50
4½ to 6	64	55½	4½ to 6	58	49
7 to 8	58	47½	7 to 8	51	40

To the large jobbing trade an additional 5 per cent. is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts on less than carloads, f.o.b. Pittsburgh, freight to destination added, in effect from May 1, 1915, are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	65	1¾ and 2 in.	52
2¼ in.	62	2¼ in.	49
2½ and 2¾ in.	68	2½ and 2¾ in.	56
3 and 3¼ in.	73	3 and 3¼ in.	60
3½ and 4½ in.	74	3½ and 4½ in.	62
5 and 6 in.	67	5 and 6 in.	56
7 to 13 in.	64		

Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., 10 per cent. net extra.

2 in. and larger, over 22 ft., 10 per cent. net extra.

Sheets.—Makers' prices for mill shipment on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots

from store, are as follows, f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice:

Blue Annealed Sheets

	Cents per lb.
Nos. 3 to 8	1.25 to 1.30
Nos. 9 to 10	1.30 to 1.35
Nos. 11 and 12	1.35 to 1.40
Nos. 13 and 14	1.45 to 1.50
Nos. 15 and 16	1.55 to 1.60

Box Annealed Sheets, Cold Rolled

	Cents per lb.
Nos. 10 and 11	1.45 to 1.50
No. 12	1.45 to 1.50
Nos. 13 and 14	1.50 to 1.55
Nos. 15 and 16	1.55 to 1.60
Nos. 17 to 21	1.60 to 1.65
Nos. 22 and 24	1.65 to 1.70
Nos. 25 and 26	1.70 to 1.75
No. 27	1.75 to 1.80
No. 28	1.80 to 1.85
No. 29	1.85 to 1.90
No. 30	1.95 to 2.00

Galvanized Sheets of Black Sheet Gauge

	Cents per lb.
Nos. 10 and 11	2.40 to 2.50
No. 12	2.50 to 2.60
Nos. 13 and 14	2.50 to 2.60
Nos. 15 and 16	2.60 to 2.70
Nos. 17 to 21	2.75 to 2.85
Nos. 22 and 24	2.90 to 3.00
Nos. 25 and 26	3.10 to 3.20
No. 27	3.25 to 3.35
No. 28	3.40 to 3.50
No. 29	3.50 to 3.60
No. 30	3.65 to 3.75

Pittsburgh

PITTSBURGH, PA., May 11, 1915.

The volume of new business holds up remarkably well. So far this month actual orders booked by the mills for rolling on nearly all kinds of finished products show an increase over the same time in April. This week the Carnegie Steel Company is operating its steel plants to about 80 per cent. of capacity, the highest rate reached in more than a year. Contracts for several large pipe lines have been closed and pipe mills report orders booked this month as largely in excess of the same time last month. The foreign demand for barb and plain wire continues heavy and local mills have recently booked some large orders. There is still talk of a large order for rails from the Russian Government, and this has been intensified by a Russian inquiry that came out the past week for 60,000 to 80,000 kegs of spikes. The much-talked-of order of 10,000 cars of various types for the Russian Government has not yet been placed, but it is believed it will be soon. The pig-iron and steel markets are showing more life. Several fairly heavy sales of basic iron have been made and there is a good deal of inquiry for billets. Coke has quieted down, but the scrap trade is better, with prices stronger.

Pig Iron.—A local interest reports a sale of 15,000 tons of basic iron, deliveries being 3000 tons a month commencing in June, at $12.65 at furnace. The seller has an advantage in freight rates over other Valley furnaces on this business, and the price nets more at the furnace than would have been obtained if the iron was being shipped from other sources. The Westinghouse Electric & Mfg. Company and the Westinghouse Machine Company are figuring on fairly large lots of foundry iron for delivery over the remainder of the year. A local sanitary interest is also reported in the market for a large lot of foundry pig iron for delivery over second half. Prices on pig iron are firmer and a higher level is expected in the very near future. We quote: Bessemer iron, $13.60; malleable Bessemer, $12.75; No. 2 foundry, $12.75 to $13; basic, $12.50 to $12.65, and gray forge, $12.50, all at Valley furnace, with a freight rate of 95c. a ton for delivery in the Cleveland and Pittsburgh districts.

Billets and Sheet Bars.—Local steel makers report the new demand for Bessemer and open-hearth billets heavier than at any time in some months. Prices in the Youngstown district are firmer than for some time. Forging billets are up about $1 per ton, sales having been made of soft forging billets at $26, maker's mill. We quote Bessemer and open-hearth billets at $19, and Bessemer and open-hearth sheet bars, $19.50 to $20, f.o.b. maker's mills, Youngstown; Bessemer and open-hearth billets, $20, and Bessemer and open-hearth sheet bars, $21, f.o.b. Pittsburgh. Forging billets are quoted at $26 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25, the regular extras being charged for larger sizes and higher carbons. Forging billets running above 0.25 to 0.60 carbon take $1 per ton extra. Axle billets are quoted at $21 to $22.

Ferroalloys.—Several shipments of English 80 per cent. ferromanganese have reached Eastern ports, and the outlook for a supply is reported to be better now than at any time since the war started. There is very little inquiry for ferromanganese for prompt shipment, which indicates that consumers are getting satisfactory deliveries. The last price of $88, seaboard, named by English makers, does not cut much figure in the market, as consumers have contracts at much lower figures. We quote 50 per cent. ferrosilicon in lots up to 100 tons, at $73; over 100 tons to 600 tons, $72; and over 600 tons, $71, delivered in the Pittsburgh district. We quote 10 per cent. ferrosilicon at $16.50; 11 per cent., $17.50; 12 per cent., $18.50, all f.o.b. cars at furnace, Ashland, Ky., Jackson or New Straitsville, Ohio, each of these points having a rate to Pittsburgh of $2 per gross ton. We quote 20 per cent. spiegeleisen at $25 at furnace. We quote ferrotitanium at 8c. per lb. in carloads, 10c. in 2000-lb. lots and over, and 12½c. in less than 2000-lb. lots.

Structural Material.—New inquiry is light and no large local jobs are in sight. Complaint is still heard of very low prices being made by some fabricators on the small amount of new work that is coming up. The McClintic-Marshall Company has taken 440 tons for a building for the Aluminum Company of America at New Kensington, Pa., and 600 tons for a bridge for the Youngstown Sheet & Tube Company; the Pittsburgh Bridge & Iron Works has taken about 150 tons for a foot and wagon approach to this bridge; the American Bridge Company has taken 300 tons of bridge work for the Buffalo, Rochester & Pittsburgh Railroad. We quote beams and channels up to 15-in. at 1.20c. for May and June delivery, and 1.25c. for third quarter, f.o.b. Pittsburgh. It is stated that some contracts have been made at the latter price.

Plates.—The Pressed Steel Car Company states emphatically that it has not received the reported order from the Russian Government for 10,000 cars, although it is believed the order will soon be placed. The Western Steel Car & Foundry Company has taken 2000 cars for the Chicago & Northwestern, and not the Pressed Steel Car Company, as reported. The Greenville Steel Car Company has taken 500 steel underframes for the Virginian Railroad and the Standard Steel Car Company 10 steel cars for the Pittsburgh Steel Company. It is denied that the Pressed Steel Car Company has taken any orders for shrapnel for Russia. The Cambria Steel Company has taken 2000 tons of plates for a merchant vessel to be built by the Maryland Steel Company for the A. H. Bull Steamship Company. It is also stated that the Cambria Company has taken upward of 2000 tons of plates for the 2000 or more cars to be built by the Pennsylvania Railroad at Altoona. Bids on more than 16,000 cars for the Pennsylvania Railroad went in on Monday, May 10, and bids on the passenger cars, from 125 to 150, are to go in on May 15. We quote ¼-in. and heavier plates at 1.15c. to 1.20c., f.o.b. Pittsburgh, for May and June delivery.

Steel Rails.—The Pennsylvania Railroad order for 138,000 tons of rails has not yet been distributed among the mills, but is expected to be given out in the next week or two. The Carnegie Steel Company has started to roll at its Edgar Thomson works 5700 tons for the Pittsburgh & Lake Erie. The new demand for light rails is fairly large, the Carnegie Company having received new orders and specifications in the past week for over 1500 tons. Prices on light rails are firmer, and one mill is reported to be asking an advance of $1 a ton. We quote standard section rails made of Bessemer stock at 1.25c., and of open-hearth, 1.34c., f.o.b. Pittsburgh. We quote light rails as follows, in carload lots: 8 and 10 lb. section, 1.275c.; 12 and 14 lb., 1.225c.; 16 and 20 lb., 1.175c.; 25, 30, 35, 40 and 45 lb. sections, 1.125c. The prices of light rails are materially shaded on large lots.

Sheets.—Shipments of sheet and tin mill products by the American Sheet & Tin Plate Company for the week ended May 8 were the heaviest in any one week for 21 months, while its April shipments were the heaviest in any one month since May, 1913. The new demand is fairly active. A wide range of prices is being quoted on galvanized sheets, some mills quoting as high as 3.50c. for No. 28, with others naming as low as 3.40c. Still higher prices for galvanized sheets are expected, as spelter is steadily going up. We quote No. 28 Bessemer black sheets at 1.80c. to 1.85c.; No. 28 galvanized at 3.40c. to 3.50c.; Nos. 9 and 10 blue annealed sheets, 1.30c. to 1.35c.; No. 30 black plate, tin-mill sizes, H. R. & A., 1.95c.; No. 28, 1.90c.; Nos. 27, 26 and 25, 1.85c.; Nos. 22 to 24, 1.80c.; Nos. 17 to 21, 1.75c.; Nos. 15 and 16, 1.70c. The above prices are for carload lots, f.o.b. at maker's mill, jobbers charging the usual advances for small lots from store.

Tin Plate.—Several of the larger makers report specifications against contracts falling off; unless they soon improve mills will have to slow down in operations. One interest, however, reports specifications coming in freely. The American Sheet & Tin Plate Company continues to operate to about 95 per cent. of its hot tin-mill capacity. On the small orders being placed, the mills are quoting from $3.15 to $3.25, but on a very desirable order the lower price would be shaded.

Wire Rods.—Shipments are still being made abroad on orders taken some time ago. The heavy foreign demand for barb and plain wire is keeping the rod mills well filled, and one local maker is said to be out of the market as a seller. Specifications against contracts are reported as quite active. We quote Bessemer, open-hearth and chain rods at $25 to $26, f.o.b. Pittsburgh, the price depending on the size of the order and the deliveries.

Carwheels.—Inquiries are in the market for about 116,000 cast-iron and forged-steel carwheels for the new cars to be built by the Pennsylvania Railroad. Prices have been advanced and we now quote standard 33-in. freight carwheels 6¼-in. rough bore at $16, and standard 36-in. passenger, the same bore, at $22.50 per wheel, f.o.b. Pittsburgh.

Shafting.—Makers report prices firmer, due to the prospective higher market on steel bars for third and fourth quarters. On contracts for forward delivery, shafting is quoted at 68 per cent. off, minimum, and one maker has quoted 67 per cent. off for fourth quarter. For very desirable business for spot shipment, 68 to 70 per cent. off is being quoted, but the higher discount is getting harder to obtain. Specifications against contracts from automobile builders and machine-tool makers are coming in freely, but from the implement trade are dull. We quote cold-rolled shafting at 68 per cent. off in carload and larger lots for forward delivery, and 63 per cent. off in small lots, f.o.b. Pittsburgh. For desirable specification and prompt delivery, makers are quoting 68 to 70 per cent. off, but it is likely the higher discount will soon be withdrawn from the market.

Railroad Spikes.—An inquiry from Russia has been received through a New York house for 6000 to 8000 tons of railroad spikes to be made to Canadian-Pacific specifications. With 10 kegs to a ton, this would mean 60,000 to 80,000 kegs. While nothing definite is known, it is believed these spikes are intended for use for double tracking the Trans-Siberian Railway. Russia has a tentative inquiry in this country for 400,000 tons of rails or more for this work. It is said the Trans-Siberian Railway intends to issue bonds in payment for the track materials needed, the Russian Government to guarantee their payment. Makers report specifications against contracts from railroads coming in more freely. There is no new buying, as the railroads have covered. The Jones & Laughlin Steel Company has taken a contract for 1000 kegs of spikes from the Government for shipment to Panama. We quote: Standard railroad spikes, $1.35 to $1.40; small railroad spikes, $1.45 to $1.50 in carload and larger lots, f.ob. Pittsburgh.

Hoops and Bands.—The 1.20c. price on steel bands for May and June is reported holding firm and 1.25c. is being quoted for third quarter. It is stated that new orders for May and June are only fair, but some contracts have been made for third quarter at 1.25c. Specifications against contracts for hoops from consumers on the Pacific coast are reported as coming in quite freely, but from other sections are only fair. We quote steel bands at 1.20c. on new orders for May and June delivery, 1.25c. for third quarter, with extras as per the steel bar card, and steel hoops at 1.25c., f.o.b. at mill.

Skelp.—The new demand is light, but local mills are fairly well filled for the next two or three months. No foreign inquiries have been received in this market for some time. Prices are firm and we quote: Grooved steel skelp, 1.12½c. to 1.15c.; sheared steel skelp, 1.17½c. to 1.20c.; grooved iron skelp, 1.50c. to 1.55c.; sheared iron skelp, 1.60c. to 1.65c., delivered to consumers' mills in the Pittsburgh district.

Wire Products.—The domestic demand for wire nails has fallen off a good deal, but for barb and plain wire is still quite active. The foreign demand for plain and barb wire continues heavy, and two local mills have recently booked some large orders for shipment to England, France and Russia. Local makers are operating their plants to close to 100 per cent. of capacity and have a large amount of work ahead. It is stated that on foreign business prices slightly higher than domestic are often obtained. Owing to the very high price of spelter, the market on galvanized wire products is strong and makers are obtaining close to full differentials. To jobbers, on new orders, the mills quote: Wire nails, $1.55; galvanized nails, 1 in. and shorter, taking an advance of $1.70 over this price, or $3.25, and galvanized nails, 1 in. and longer, an advance of $1.20, or $2.75; plain annealed wire, $1.35; galvanized barb wire and fence staples, $2.10 to $2.20; painted barb wire, $1.60, all f.o.b. Pittsburgh, freight added to point of delivery, terms 30 days net, less 2 per cent. for cash in 10 days. We quote woven wire fencing at 72 per cent. off in carload lots, 71 per cent. off on 1000-rod lots and 70 per cent. on small lots, f.o.b. Pittsburgh.

Iron and Steel Bars.—Mills report that the new demand for steel bars is heavy, and specifications against contracts are coming in actively. Negotiations are still on between the bar mills and the implement makers for the supply of steel bars for the latter over the last six months of this year, but as yet no contracts have been closed. It is not believed that the efforts of the makers to limit deliveries on these contracts to the last half of 1915 will be successful. Shipments by two of the larger local interests are heavier now than at any time for some months. The demand for bars for reinforcing purposes is reported active, but with prices only fairly strong. The demand for iron bars is better, but none of the mills in this district is running to more than 50 to 60 per cent. of capacity. We quote steel bars on new orders at 1.20c. for second quarter and 1.25c. for third quarter. We quote common iron bars, made from part scrap, at 1.20c. to 1.25c., and test iron bars at 1.30c., f.o.b. Pittsburgh.

Cold-Rolled Strip Steel.—Makers continue to report an active demand and state that specifications against contracts are coming in at a very good rate. Some foreign inquiry has recently come in the market, with good promise of some business being placed. On small lots for prompt delivery $2.85 is generally being quoted. We quote hard-rolled steel, 1½ in. and wider, under 0.20 carbon, sheared or natural mill edges, per 100 lb., $2.75, delivered. Extras, which are standard among all the mills, are as follows:

Thickness, in.	Extras for thickness	Extras for soft or intermediate tempers	Extras for straightening and cutting to lengths not less than 24 in.
0.100 and heavier	Base	$0.25	$0.10
0.099 to 0.050	$0.05	0.25	0.15
0.049 to 0.035	0.20	0.25	0.15
0.034 to 0.031	0.35	0.40	0.25
0.030 to 0.025	0.45	0.40	0.40
0.024 to 0.020	0.55	0.40	0.50
0.019 to 0.017	0.85	0.50	1.10
0.016 to 0.015	1.25	0.50	1.10
0.014 to 0.013	1.95	0.50	1.25
0.012	2.30	0.50	coils only
0.011	2.65	0.50	coils only
0.010	3.00	0.50	coils only

Merchant Steel.—The demand is more active than for some months and prices are getting stronger. One leading maker is reported to have advanced prices on all grades of seasonable steel about $1 per ton. On small lots we quote: Iron finished tire, ½ x 1½ in. and larger, 1.30c., base; under ½ x 1½ in., 1.45c.; planished tire, 1.50c.; channel tire, ¾ to ⅞ and 1 in., 1.80c. to 1.90c.; 1⅛ in. and larger, 1.90c.; toe calk, 1.90c. to 2c., base; flat sleigh shoe, 1.65c.; concave and convex, 1.70c.; cutter shoe, tapered or bent, 2.20c. to 2.30c.; spring steel, 1.90c. to 2c.; machinery steel, smooth finish, 1.70c.

Rivets.—Makers report the demand for boiler rivets better, but for structural rivets quiet. Prices are firmer, due to the higher cost of raw materials, but as yet are not actually higher. We quote structural rivets at 1.40c. to 1.45c., and cone-head boiler rivets, at 1.50c. to 1.55c. in large lots, f.o.b. Pittsburgh.

Nuts and Bolts.—Consumers are specifying more freely against their contracts and the new demand is better than in a long time. On account of the higher prices for raw materials, another advance in prices of nuts and bolts in the near future is generally expected. Discounts to the large trade are as follows:

U. S. S. Cold Punched Blank and Tapped, Chamfered, Trimmed and Reamed

½ in. and smaller, hex.....8.1c. per lb. off
⅝ in. and larger hex.....7.3c. per lb. off
Square, all sizes .....5.8c. per lb. off

Semi-Finished Tapped

½ in. and smaller hex.....85-10-10-10 off
⅝ in. and larger hex.....85-10-10 off

Black Bulk Rivets

7/16 x 6½, smaller and shorter.....80-10-5 off

Package Rivets 1000 Pcs.

Black, metallic tinned and tin plated....75-10-10 off

Wrought Pine.—Tubular goods, so far in May, have been in heavier demand than in the same period in April. Orders taken by one leading concern have been practically up to its capacity. The National Tube Company has taken a contract from Louisiana oil interests for 177 miles of 12-in. pipe, or about 28,000 tons, and also an order for 28 miles of 20-in. pipe for gas distribution in the Pittsburgh district, about 6000 tons. A mill in the Wheeling district has taken 55 miles of 8-in. screw pipe for delivery in Oklahoma. The new discounts on iron and steel pipe, printed on a previous page, are being firmly held.

Boiler Tubes.—Makers state the new demand for locomotives tubes is heavier than for some time, but for merchant tubes is still quiet. The new discounts on iron and steel boiler tubes are well maintained, being shaded only in exceptional cases.

Coke.—A local interest has sold about 10,000 tons of coke per month to a blast furnace for delivery over the remainder of the year at a price said to be $1.75 per net ton at oven, or slightly under. No large inquiries for blast furnace coke are in the market. The demand for prompt shipment is quiet, but there is not much coke pressing the market to find sale. We quote best grades of furnace coke for delivery over the remainder of year at $1.65 to $1.75, and for spot shipment $1.50 per net ton at oven. We quote standard makes of 72-hr. foundry coke for prompt shipment at $1.90 to $2.25, and on contracts for remainder of the year, from $2.15 up to $2.50, per net ton at oven. Production has fallen off slightly, the Connellsville Courier giving the output of the upper and lower Connellsville regions for the week ended May 1 as 292.891 net tons, a decrease over the previous week of 6602 tons.

Old Material.—Most sales being made are still between dealers who are buying to cover short sales. Two of the larger consumers in this district have heavy stocks and are not interested in the market, except at prices lower than the dealers will accept. The lists of the Pennsylvania and Baltimore & Ohio railroads were closed last week. Part of the heavy steel scrap of the Pennsylvania Railroad for the Lines East is reported to have sold at $12.10, Altoona, and the remainder is said to have gone to a local consumer at about the same price. The demand for scrap is more active in the Youngstown district than here, but prices there are ruling somewhat lower than in the Pittsburgh market. We note sales of 400 tons of rerolling rails at $12; 500 to 600 tons of heavy steel scrap at $11.75 to $12, delivered; 500 tons of turnings at about $8 delivered, and upward of 1000 tons of borings at $8.50 or slightly higher, delivered. Prices are firm, but not any higher. For delivery in Pittsburgh and nearby districts that take Pittsburgh freights, dealers quote about as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery	$11.75
Compressed side and end sheet scrap	$10.25 to 10.50
No. 1 foundry cast	12.00 to 12.25
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	9.25 to 9.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	11.75 to 12.00
No. 1 railroad malleable stock	10.50 to 10.75
Railroad grate bars	8.50 to 8.75
Low phosphorus melting stock	13.75 to 14.00
Iron car axles	18.75 to 19.25
Steel car axles	13.25 to 13.75
Locomotive axles, steel	19.75 to 20.25
No. 1 busheling scrap	10.50 to 10.75
No. 2 busheling scrap	7.50 to 7.75
Machine shop turnings	7.75 to 8.00
Old carwheels	11.75 to 12.00
Cast-iron borings	8.25 to 8.50
*Sheet bar crop ends	12.00 to 12.25
Old iron rails	12.75 to 13.00
No. 1 railroad wrought scrap	10.75 to 11.00
Heavy steel axle turnings	8.50 to 8.75
Heavy breakable cast scrap	10.75 to 11.00

*Shipping point.

The Pittsburgh office of M. A. Hanna & Co., of which B. S. Stephenson is resident manager, has been moved to room 1445 Oliver Building.

Chicago

CHICAGO, ILL., May 12, 1915.—(*By Wire.*)

Purchases in behalf of Russia were prominently in the foreground last week, with the placing of 20,000 cars, the accepted distribution of which gives 10,000 to the Pressed Steel Car Company, 8000 to the Pullman Company and 2000 to the Seattle Car & Mfg. Company, together with the buying of a large tonnage of rails, of which approximately 13,000 tons will be rolled at Chicago. Of the pending domestic car business, the Northwestern's 2000 will be built at Chicago, the Rock Island will close for 5000 in the current week and the Milwaukee proposes the purchase of an additional 1000. Local rail orders last week, including the export tonnage, provide for 25,000 tons, while among liberal orders for track fastenings one for 6500 tons of tie plates is prominent. For other purposes than car building, the buying of shapes has been limited and the market is somewhat shaky as to price. In contrast, steel bars, with the exception of deformed reinforcing bars of special manufacture, are being marketed at very firm quotations. The fact that some of the implement interests have already made contracts for the next six months at the current price has some bearing on this condition. Plates continue weak, and the outlook for large business is not promising. An order for 2700 tons of tank plate is conspicuous in the week's bookings. The buying of pig iron is less active and the manner in which some pending inquiries are being delayed by the buyers indicates a disposition to let the market rest until some of the effects of recent liberal buying have subsided.

Pig Iron.—The early part of last week witnessed the closing of more of the important tonnages that had been pending, but as the week advanced buying tapered off, although several inquiries for round lots remain to be closed. Bargaining can no longer be pursued by the melter with the same advantage that obtained two weeks ago, and in consequence those who have still to cover for their last half needs appear disposed to let the situation drift for a time. Some business is being placed, and this trading indicates that $9.50, Birmingham, can still be done for prompt shipment and probably third quarter iron. For the last quarter $9.75 is the price, with $10 asked for certain brands. Lake irons, both foundry and malleable, continue available on the $13 basis for prompt shipment, with an advance for delivery in the last quarter. The following quotations are for iron delivered at consumers' yards, except those

for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace, and do not include a switching charge averaging 50c. a ton:

Lake Superior charcoal, Nos. 2 to 5	$15.75
Lake Superior charcoal, No. 1	16.25
Lake Superior charcoal, No. 6 and Scotch	16.75
Northern coke foundry, No. 1	$13.50 to 13.75
Northern coke foundry, No. 2	13.00 to 13.50
Northern coke foundry, No. 3	12.50 to 13.00
Southern coke, No. 1 f'dry and 1 soft	14.00 to 14.25
Southern coke, No. 2 f'dry and 2 soft	13.50 to 14.00
Malleable Bessemer	13.00 to 13.25
Standard Bessemer	16.50
Basic	12.50 to 13.00
Low phosphorus	20.00 to 20.50
Jackson Co. and Ky. silvery, 8 per cent	16.90
Jackson Co. and Ky. silv'y, 10 per cent	17.90

(*By Mail*)

Rails and Track Supplies.—Of the orders for rails placed in this country by the Russian Government, 12,900 tons will be rolled by the mills at Chicago, which, added to 10,000 tons from the Rock Island Railroad and 1800 tons released by the Baltimore & Ohio, made a comfortable showing for the week. The ordering out of track fastenings has continued on a generous scale, and 6500 tons of tie plates have been bought by the Southern Pacific. The Illinois Central and the Milwaukee railroads also have taken small lots of tie plates. We quote standard railroad spikes at 1.45c. to 1.50c., base; track bolts with square nuts, 1.90c., base, all in carload lots, Chicago; tie plates, $23.25 to $24.25, f.o.b. mill, net ton; standard section Bessemer rails, Chicago, 1.25c., base; open-hearth, 1.34c.; light rails, 25 to 45 lb., 1.07c.; 16 to 20 lb., 1.12c.; 12 lb., 1.17c.; 8 lb., 1.22c.; angle bars, 1.50c., Chicago.

Structural Material.—The immediate interest of the structural mills is largely directed toward the securing of the tonnage involved in the pending car business. It is understood that 2000 tons of the steel which will go into the Northwestern cars, to be built by the Western Steel Car & Foundry Company, has been placed, but the balance remains to be booked, as well as the material for the additional 1000 cars that railroad proposes to buy. The Rock Island has sent out an inquiry covering 5000 cars to have steel underframes, while the car builders have been given to understand that the Milwaukee will ask prices on 2000 cars in addition to the 2000 it plans to build in its own shops. It is also generally accepted that the Russian inquiry for cars, upon a part of which, covering 8000, the Pullman Company has been figuring exclusively in this market, has been satisfied. Contracts for fabricated steel placed last week included 1353 tons for Burlington Railroad bridges, taken by the Ft. Pitt Bridge Works; 2000 tons for the Carnegie Library at San Francisco, taken by the Pacific Rolling Mill Company; 256 tons for a building at Cedar Rapids, Iowa, taken by the Gage Structural Steel Company; and 250 tons for a wharf shed at Oakland, Cal., taken by Dyer Brothers. Bridge shops are reported as buying some plain material for stock, but these purchases are on a very modest scale. For structural material, some lack of uniformity has developed in the matter of prices, and for Chicago delivery 1.389c. is not an absolute minimum. We quote for Chicago delivery of structural steel from mill 1.35c. to 1.389c.

The limitations on building activity at Chicago are being felt with increasing keenness as the labor difficulties in the building trades are prolonged. In local store trade this reduction has become distinctly noticeable. We quote for Chicago delivery of plain material out of stock 1.75c.

Plates.—Car business now under consideration offers no great encouragement to the makers of plates, the tonnage likely to materialize therefrom being very limited. Plate mill operations have depended almost entirely on the orders that have come in from day to day. One mill which contemplated shutting down at the end of last week was able to continue operations on the strength of specifications received at the last moment and applying against a contract for 2700 tons of oil-tank plate for the Santa Fe Railroad placed with the Kennicott Company, Chicago. With such a scarcity of bookings, a strengthening of prices is hardly to be expected, and we continue to quote for Chicago delivery of plates from mill 1.289c. to 1.339c.

We quote for Chicago delivery of plates out of store 1.75c.

Sheets.—Local mills find themselves sold up better on blue annealed sheets than any other grade. One interest has its rollings assured for five to six weeks. For black sheets the demand is still light, and with respect to galvanized the situation is unchanged. We quote for Chicago delivery from mill: No. 10 blue annealed, 1.489c.; No. 28 black, 1.939c.; No. 28 galvanized, 3.939c. to 4.189c.

Local jobbers have advanced the price of galvanized sheets to the basis of 4c. for No. 28 gauge, which price is still little, if any, in advance of mill quotations. We quote for Chicago delivery from jobbers' stocks as follows, minimum prices applying on bundles of 25 or more: No. 10 blue annealed, 1.95c.; No. 28 black, 2.55c.; No. 28 galvanized, 4c.

Bars.—Although the improvement does not seem to be general with all of the steel-bar mills, specifications recently booked by at least one interest permit operating its mills practically at capacity. Implement interests have been specifying more liberally, and the expansion in the tonnage of specifications is understood to be traceable for the most part to domestic sources. A beginning of contracting by the smaller implement manufacturers has been made, and thus far these contracts, which are for six months only, are on the basis of 1.20c., Pittsburgh. The closing of those larger contracts which finally establish the minimum quotation for this business is still to be effected. For steel bars of standard specifications the price of 1.20c., Pittsburgh, appears to be firmly maintained, but in connection with reinforcing bars, particularly where sold through companies specializing in deformed bars for that purpose, prices as low as 1.10c., Pittsburgh, are reported. Sales of billets for export are noted, among them 1500 tons for Great Britain. The tonnage of iron bars appearing in the market is very limited, and the mills of this district are operating at from 35 to 50 per cent. of capacity. We quote for mill shipments as follows: Bar iron, 1.15c.; soft steel bars, 1.389c.; hard steel bars, 1.20c.; shafting, in carloads, 65 to 68 per cent. off; less than carloads, 60 per cent. off.

We quote store prices for Chicago delivery: Soft steel bars, 1.65c.; bar iron, 1.65c.; reinforcing bars, 1.65c. base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting 60 per cent. off, and in carloads, 62 per cent. off.

Rivets and Bolts.—The buying of rivets is desultory and anything like an attractive inquiry brings out concessions that represent a wide spread in prices. Recent reports from the makers of nuts and bolts reflect a more liberal specifying by the trade and a reasonably stable condition of the market. Quotations are as follows: Carriage bolts up to ⅜ x 6 in., rolled thread, 80-15; cut thread, 80-10; larger sizes, 75-17½; machine bolts up to ⅜ x 4 in., rolled thread, 80-20; cut thread, 80-15; larger sizes, 80-2½; coach screws, 85-2½; hot pressed nuts, square, $6.60 to $6.40 off per cwt.; hexagon, $7.60 to $7.30 off per cwt. Structural rivets, ¾ to 1¼ in., 1.35c. to 1.45c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

We quote out of store: Structural rivets, 2c.; boiler rivets, 2.10c.; machine bolts up to ⅜ x 4 in., 75-15; larger sizes, 70-10-10; carriage bolts up to ⅜ x 6 in., 75-10; larger sizes, 70-15 off, hot pressed nuts, square, $6, and hexagon, $6.70 off per cwt.

Wire Products.—There has not been the falling off in orders for wire nails that has been felt with respect to some of the other wire products. The makers are showing some disposition to encourage specifications for prompt shipment, and favorable prices are being quoted. We quote to jobbers as follows: Plain wire, No. 9 and coarser, base, $1.589; wire nails, $1.739 to $1.789; painted barb wire, $1.789; galvanized barb wire, $2.289 to $2.389; polished staples, $1.789; galvanized staples, $2.289 to $2.389, all Chicago.

Cast-Iron Pipe.—The leading interest was the successful bidder for 400 tons of high pressure pipe placed at Detroit and was awarded two contracts at Cincinnati totaling 3400 tons. New pipe work is developing slowly. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $25.50; 6 to 12 in., $23.50; 16 in., and up, $23, with $1 extra for gas pipe.

Old Material.—The strengthening tendencies exhibited in this market in the earlier part of the week appear to have received a check. Prices of a number of grades of

scrap for a few days showed a definite advance above our last quotations, but at this time the market has generally resumed the level of prices last quoted. Sales have been moderate in volume and miscellaneous in character, with no special activity in any lines. The railroads have been disposing of the scrap they have for sale at prices representing the top of the market, an indication of the anticipated upward movement of the market. New lists of railroad scrap being offered include 700 tons by George W. Jennings, 650 tons by the Omaha, 600 tons by the Chicago Great Western, 2300 tons by the Milwaukee and a list from the New York Central. Crane Company is offering 250 tons of cast borings. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton	
Old iron rails	$11.75 to	$12.25
Old steel rails, rerolling	10.25 to	10.75
Old steel rails, less than 3 ft.	10.00 to	10.50
Old carwheels	9.75 to	10.00
Heavy melting steel scrap	9.25 to	9.50
Frogs, switches and guards, cut apart	9.25 to	9.50
Shoveling steel	8.75 to	9.00
Steel axle turnings	7.00 to	7.25
	Per Net Ton	
Iron angles and splice bars	$11.50 to	$12.00
Iron arch bars and transoms	11.75 to	12.25
Steel angle bars	8.50 to	8.75
Iron car axles	13.50 to	13.75
Steel car axles	10.50 to	11.00
No. 1 railroad wrought	9.00 to	9.25
No. 2 railroad wrought	8.25 to	8.75
Cut forge	8.25 to	8.75
Steel knuckles and couplers	8.00 to	8.50
Steel springs	8.75 to	9.25
Locomotive tires, smooth	8.50 to	9.00
Machine shop turnings	5.00 to	5.50
Cast borings	5.00 to	5.50
No. 1 busheling	7.25 to	7.75
No. 2 busheling	6.25 to	6.75
No. 1 boilers, cut to sheets and rings	5.50 to	6.00
Boiler punchings	8.25 to	8.50
No. 1 cast scrap	9.00 to	9.25
Stove plate and light cast scrap	7.75 to	8.00
Grate bars	7.50 to	7.75
Railroad malleable	8.00 to	8.25
Agricultural malleable	7.25 to	7.50
Pipes and flues	6.50 to	6.75

Philadelphia

PHILADELPHIA, PA., May 11, 1915.

Standing out in this market are the increasing tonnage of exports to Europe and the slow but apparently steady buying on the part of domestic railroads. It is pointed out that if the railroads should come strongly into the market, prompt deliveries could not be made with ease and for this reason some mill representatives say they are taking on future commitments with caution. Prices are steady, but no advances are shown. The exports include billets, blooms, rods and wire, with the foreign billet business quite generally distributed. To China has been shipped 100 tons of finished material and moderate quantities of plates have been sent to South America (Valparaiso, Chile) and to Africa. The specifications for foreign shipment are regulated by the available cargo space. The sales of railroad equipment to Russia have been good and more orders are pending. Structural material shows an improved tone. Sheets are steady. The demand for pig iron has been for small lots almost exclusively, but in the aggregate they are running ahead of last month. In old material a better tendency is seen and prices are firmer.

Iron Ore.—There is no demand for foreign ore and if there were the shortage of ocean vessels would make importation difficult. On old contracts, in the week ended May 8, 14,600 tons arrived from Chile and 6000 tons from Cuba.

Pig Iron.—The transactions of the week were confined almost entirely to small lots, but their aggregate surprised most furnace representatives and the general feeling is one of encouragement. A seller of Virginia iron reports that his sales are going ahead of those of last month, but at the same time his deliveries are not increasing and to him the purchasing means that consumers are indulging in some speculation on their own account. Standard low phosphorus is moving in small lots only, the demand seeming to be for day-to-day requirements, which is unusual with this grade of iron. About 1100 tons of Lebanon low phosphorus has been taken in small lots. Basic is quiet, though there has been a little inquiry and business could be done if price concessions were granted. A Delaware River pipe company is feeling about for 6000 tons of low grade iron. One producer of Southern iron is insistent in quoting $10, Birmingham, for No. 2, and a maker of Virginia iron is adhering to the advances announced a week ago and indicated in the subjoined table. Quotations for standard brands for early delivery in buyers' yards in this district are as follows:

Eastern Penna. No. 2 X, foundry	$14.25 to	$14.50
Eastern Penna. No. 2 plain	14.00 to	14.25
Virginia, No. 2 X, foundry	15.25 to	15.75
Virginia No. 2 plain	15.00 to	15.25
Gray forge	13.25 to	13.50
Basic	13.25 to	13.50
Standard low phosphorus	20.00 to	20.50

Ferroalloys.—At this writing the promised arrivals have not been reported, but they are expected at almost any moment. The quotation for 80 per cent. ferromanganese continues at $88, seaboard. For lots of one or two tons there is a better inquiry and for such purchases 6c. to 7c. per lb. has been paid. The quotations for 50 cent. ferrosilicon stand at $71 to $73, Pittsburgh, according to quantity.

Bars.—Specifications have been fairly good, but new business is light. A few steel-bar contracts have been written for the third quarter at 1.409c., Philadelphia. A company manufacturing seamless tubes placed an order for 1000 tons of round bars. The inquiry for shrapnel rounds is increasing, the American Locomotive Company being in the market for 26,000 tons, and there are a number of smaller inquiries. Iron bars are firm at 1.17½c. to 1.20½c., Philadelphia.

Plates.—A good all-round demand continues to come from makers of tanks, boilers, and reservoirs and from bridgebuilders. The export demand is growing, though restricted by ocean freight conditions. Small shipments have been made to Valparaiso, Chile, and to Africa. More inquiry is coming from the locomotive shops, but the orders from this direction are placed slowly. The quotations range from 1.309c. to 1.359c., Philadelphia.

Rails.—A company with executive offices located here confidently expects to receive an order from the Russian Government for 30,000 tons of rails. That country is concentrating on the building of railroads to its border for the conveyance of troops and supplies. From the Cambria Steel Company it has purchased 20,000 steel axles, amounting to 7000 tons, and more business in track and rolling equipment is pending. The impending purchases of the Pennsylvania Railroad will include 30,000 tons of 125-lb. rails. Between 500 and 600 tons have been ordered by the Virginian Railway. The Baltimore & Ohio Railroad is placing orders for tieplates.

Structural Steel.—Not much of moment has come out in this district, but business is better and there is a more concerted holding to the basis of 1.20c., Pittsburgh, or 1.359c., Philadelphia. The Pennsylvania Railroad and other roads, including the Southern and the Virginian, are asking bids on several small bridges. The 200 tons required for a plant extension by the Hickok Mfg. Company, Harrisburg, is reported to have been taken by the Pennsylvania Steel Company.

Sheets.—The market is steady and specifications are freer at 1.459c. to 1.509c., Philadelphia, for No. 10 blue annealed.

Billets.—The feature of the market is the steady increase in sales for export. Several thousand tons have been ordered for export, but specifications are placed only as cargo space is found. The foreign business is declared to be clean and satisfactory, inasmuch as the price obtained exceeds that for domestic delivery and payment is made f.o.b. seaboard. A Lebanon steel company has purchased 4000 tons for May, June and July delivery, and a nearby manufacturer has contracted for 1000 tons. The quotation is firm at $22.02, Philadelphia, for open-hearth rolling billets.

Coke.—In foundry coke there is more activity because of the renewal of contracts, and prices are a trifle firmer, especially for future delivery. Furnace coke is not as active in this district as it is further west. Quotations for standard Connellsville coke range as follows: Prompt furnace, $1.60 to $1.65; contract furnace

to January 1, $1.75; prompt foundry, $2 to $2.35, and contract foundry, $2.20 to $2.35, all prices being per net ton at oven. Freight rates from the principal producing districts are as follows: Connellsville, $2.05; Latrobe, $1.85, and Mountain, $1.65.

Old Materials.—A better demand exists for all grades. Three mills are reported to have paid $11.50 for heavy melting steel, and some of the dealers are asking up to $12. A corresponding number of mills have paid $11.50 for old carwheels, and the dealers are asking up to $12 for them also. For wrought pipe, $10.75 has been paid for 250 tons. That the feeling is better is generally agreed. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania and taking freight rates from 35c. to $1.35 per gross ton, are as follows:

No. 1 heavy melting steel	$11.50 to $11.75
Old steel rails, rerolling	11.50 to 12.00
Low phos. heavy melting steel scrap.	14.50 to 14.75
Old steel axles	14.00 to 14.50
Old iron axles	17.50 to 18.00
Old iron rails	15.00 to 15.50
Old carwheels	11.50 to 12.00
No. 1 railroad wrought	13.00 to 13.25
Wrought-iron pipe	10.75 to 11.00
No. 1 forge fire	8.00 to 8.50
Bundled sheets	9.00 to 9.50
No. 2 busheling	7.75 to 8.25
Machine shop turnings	8.50 to 8.75
Cast borings	8.00 to 8.25
No. 1 cast	12.25 to 12.50
Grate bars, railroad	9.00 to 9.25
Stove plate	9.00 to 9.25
Railroad malleable	9.50 to 10.00

Buffalo

BUFFALO, N. Y., May 11, 1915.

Pig Iron.—Little snap or life is seen in the market as far as new business is concerned. The largest inquiry before the producers of the district is for about 3000 tons of foundry from a New England manufacturer. Aside from this the demand is light, being principally for small filling-in lots and special high silicon grades and charcoal irons. A good degree of activity is noted in coke and special interest attaches to the hearing before a representative of the Interstate Commerce Commission now being held in Buffalo for the readjustment of freight rates on coke. The majority of the producers of this district are holding to $13 at furnace as the minimum for the principal grades of iron, and prices quoted last week are therefore continued as follows, for current and last half delivery, f.o.b. furnace:

No. 1 foundry	$13.25 to $13.50
No. 2 X foundry	13.00 to 13.25
No. 2 plain	12.75 to 13.00
No. 3 foundry	12.50 to 12.75
Gray forge	12.50
Malleable	13.00 to 13.25
Basic	13.25 to 13.75
Charcoal, regular grades and analysis	15.75 to 17.25
Charcoal, special grades and analysis	19.00 to 20.00

Finished Iron and Steel.—Increased interest by buyers of bar materials is shown as to prices for deliveries over the remainder of the year, with most of the mills taking the position that they do not wish to sell beyond the third quarter. Some contracting has been done for third quarter for bars, shapes and plates on the 1.25c., Pittsburgh base, and it is understood that in a few instances contracts have been taken for fourth quarter business at 1.30c. The demand for shafting is good and prices are more firmly held. In structural shapes the demand is improving. The Buffalo office of the Turner Construction Company has received the contract for the Ford Motor Company's service building and assembling plant in this city, involving about 300 tons of reinforcing bars. The Charles F. Ernst Sons Company, Buffalo, has the contract for structural steel for an addition to St. Joseph's Collegiate Institute, this city, about 100 tons. It is understood that the Lackawanna Bridge Company has been awarded a sub-contract for the steel for the Lehigh Valley passenger terminal, Buffalo, 1500 tons.

Old Material.—Although the market is not quite so active as a week ago, the demand continues good and fair shipments of heavy melting steel, turnings, borings, busheling scrap and bundled sheet scrap are going forward to consumers. Dealers are disposed to sell in larger tonnages for 30 to 60 days ahead, at present prices, the supposition being that no great advance will develop within that time. Stocks are large and a good amount of scrap is now being produced right along. For cast, malleable and wrought scrap the local demand has been comparatively light for the week and no sales of consequence have been made. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, unchanged from last week, as follows:

Heavy melting steel	$10.50 to $11.00
Low phosphorus steel	13.00 to 13.50
No. 1 railroad wrought scrap	10.00 to 10.50
No. 1 railroad and machinery cast	10.50 to 11.00
Old steel axles	12.00 to 12.50
Old iron axles	16.00 to 16.50
Old carwheels	10.75 to 11.25
Railroad malleable	9.50 to 10.00
Machine shop turnings	5.75 to 6.25
Heavy axle turnings	8.50 to 9.00
Clean cast borings	6.50 to 6.75
Old iron rails	11.00 to 11.50
Locomotive grate bars	9.00 to 9.50
Stove plate (net ton)	8.25 to 8.75
Wrought pipe	7.00 to 7.50
Bundled sheet scrap	7.25 to 7.75
No. 1 busheling scrap	8.50 to 9.00
No. 2 busheling scrap	6.50 to 7.00
Bundled tin scrap	9.00

Cleveland

CLEVELAND, OHIO, May 11, 1915.

Iron Ore.—The market has apparently settled down to a dull spell, very few sales being reported and little new inquiry pending. The amount of ore on Lake Erie docks May 1 was slightly less than on May 1, 1914, according to figures compiled by the Lake Superior Iron Ore Association. On May 1, 1915, there was 5,886,412 gross tons of ore on the docks as compared with 5,919,717 tons May 1, 1914. The May 1, 1915, figures do not include 7309 tons of ore placed on docks during April as the dock balance on May 1 is figured for ore delivered during the past season. Shippers generally have agreed to give buyers the benefit of the 5c. reduction in freight rate made on Mesaba ore, providing railroads do not make up for this with a 5c. dockage charge, and this will mean a 5c. reduction from the price of Mesaba ore as quoted. We quote prices as follows, delivered to lower lake ports: Old range Bessemer, $3.75; Mesaba Bessemer, $3.50; Old Range non-Bessemer, $3.00; Mesaba non-Bessemer, $2.85.

Pig Iron.—The market is very dull. Consumers who have not contracted for the last half appear to be in no hurry to do so and some of the furnacemen are making no efforts to book orders, saying that they do not care to take on additional tonnage at present prices and that they are unable to get any advance over recent quotations. Northern foundry iron is quoted at $12.50 to $12.75 Valley furnace for No. 2 for spot shipment and for the last half delivery and at the same price, Cleveland, for outside shipment. The price advance on Southern iron is being maintained, $9.75 to $10.00, Birmingham, for No. 2, being the general quotation, although some spot iron may possibly still be had at $9.50. An Indiana melter has purchased 1500 tons of malleable. We note the sale of 150 tons of 6 per cent. Ohio silvery iron at $14.50 at furnace, the usual differential on this iron now being 25c. Gray-iron foundries in this territory and the Central West are quite busy at present, the only exception being the stove foundries. Conditions among the latter apparently show little or no improvement. The heavy demand for machine tools has helped some of the local foundries materially. The general demand for malleable castings has improved and malleable foundries, except those that cater almost entirely to the railroad trade, are busier than they were a few weeks ago. We quote delivered Cleveland as follows:

Bessemer	$14.55
Basic	$13.45 to 13.60
Northern No. 2 foundry	13.25 to 13.50
Southern No. 2 foundry	13.50 to 14.00
Gray forge	13.00
Jackson Co. silvery 8 per cent. silicon.	16.37 to 16.62
Standard low phos. at furnace	19.75 to 20.00

Coke.—Not many foundry coke consumers are as yet placing contracts for the last half. However, one large consumer has contracted for 1000 cars of Wise County coke for delivery during the year. The best makes of Connellsville foundry coke are held at $2.25

to $2.50 per net ton at oven for contracts, and about $2.25 for spot shipment. Furnace coke is quoted at $1.50 to $1.60 for prompt shipment and $1.75 for the last half.

Finished Iron and Steel.—The concession made on steel-bar prices for the implement trade caused considerable disappointment among dealers in this territory, as they had closed up quite a few contracts with this trade at regular prices. These contracts will doubtless have to be readjusted on the 1.20c. basis for the last half delivery. Considerable other steel-bar tonnage has been contracted for at 1.25c. for the third quarter and 1.30c. for the fourth quarter. While some sellers maintain that the concession to the implement makers will not affect prices to other consumers, others express doubt on this matter and it will probably take a few days to clear up the situation. Specifications on contracts are very satisfactory, showing an improvement over April, but the volume of new orders is not large and unless new business improves there is likely to be some falling off in specifications. A feature of the plate market is that one seller has booked some good contracts for the last half at 1.25c., although most mills have not been quoting that price beyond the third quarter. For early shipment plates are still quoted at 1.15c. to 1.20c. In structural lines a good volume of small work is coming out, but none of any size. The American Bridge Company has taken 182 tons for a fire station in Toledo and the B. F. Goodrich Company at Akron will shortly be in the market for a round tonnage for a new building. Sheet-bar specifications have improved and sheets are in better demand and slightly firmer. The usual differentials on galvanized sheets are not being adhered to, owing to the spelter situation, dealers making quotations according to the gauges. We quote black sheets at 1.75c. to 1.85c. for No. 28, galvanized at 3.40c. to 3.60c. for No. 28, and blue annealed at 1.30c. to 1.35c. for No. 10. Bar iron is very dull, with prices unchanged, at 1.10c. Pittsburgh, or 1.13½c. Chicago. The Cleveland Railway Company has placed an order with the Algoma Steel Company for 1100 tons of standard section 80-lb. open-hearth rails at $29.05 delivered or nearly $2.50 below the prices of American rails. Warehouse business continues good. Jobbers' prices are 1.80c. for steel bars and 1.90c. for plates and structural material.

Bolts.—Conditions in the bolt and nut trade continue to improve and there is talk of a further advance in prices. Specifications are coming out in good volume and there is some inquiry for the last-half contracts, but makers so far have declined to make contracts for that delivery. The demand for rivets is only moderate, but prices are well maintained. We quote rivets at 1.45c., Pittsburgh, for structural and 1.55c. for boiler rivets in carload lots. Bolt and nut discounts are as follows: Common carriage bolts, ⅜ x 6 in., smaller or shorter, rolled thread, 80 and 15 per cent.; cut thread, 80 and 10 per cent.; larger or longer, 75 and 17½ per cent.; machine bolts with h.p. nuts, ⅜ x 4 in., smaller or shorter, rolled thread, 80 and 20 per cent.; cut thread, 80 and 15 per cent.; larger or longer, 80 and 2½ per cent.; coach and lag screws, 85 and 2½ per cent.; square h.p. nuts, blank or tapped, $6.40 off; hexagon h.p. nuts, blank or tapped, $7.30 off; c.p.c. and t. square nuts, blank or tapped, $6.10 off; hexagon, ⅝ in. and larger, $7.60 off; 9/16 and smaller, $8.30 off; semi-finished hexagon nuts, ⅝ in. and larger, 85, 10, 10 and 5 per cent.; 9/16 and smaller, 85, 10, 10, 10 and 5 per cent.

Old Material.—The market is very dull and a weakness has developed, although in the absence of sales quotations generally are unchanged. About the only sales reported are small transactions between dealers Dealers have been shipping scrap faster than needed and as a result a congestion has been caused here and in Youngstown, and shipments are being held up. The Big Four Railroad will close on a large list tomorrow and the Lake Shore division of the New York Central will receive bids Friday on a good sized list. Iron car axles sold by the Wheeling & Lake Erie Railroad last week brought only $13 per gross ton. This indicates that the price on this grade of scrap is about $2 a ton below recent nominal quotations. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton

Old steel rails, rerolling	$11.00 to $11.75
Old iron rails	12.00
Steel car axles	12.00 to 12.50
Heavy melting steel	10.25 to 10.50
Old carwheels	9.75 to 10.00
Relaying rails, 50 lb. and over	22.50
Agricultural malleable	8.00 to 8.50
Railroad malleable	10.00 to 10.25
Steel axle turnings	8.75 to 9.00
Light bundled sheet scrap	8.00 to 8.50

Per Net Ton

Iron car axles	$13.00 to $13.50
Cast borings	6.00 to 6.25
Iron and steel turnings and drillings	5.50 to 5.75
No. 1 busheling new	8.50 to 8.75
No. 1 busheling old	8.25 to 8.50
No. 1 railroad wrought	9.50 to 9.75
No. 1 cast	9.75 to 10.25
Stove plate	7.75 to 8.00

Cincinnati

CINCINNATI, OHIO, May 12, 1915.—(*By Wire.*)

Pig Iron.—Considerable malleable iron has been purchased in this territory lately. Two Ohio melters took 2000 and 4000 tons respectively for last half shipment. An Indiana firm also covered for its last half requirements, and there is an order pending in central Ohio for 1500 tons that is expected to be closed this week. Foundry iron is slow, sales to actual consumers being mainly lots of 100 to 300 tons. A large percentage of these purchases are of Southern iron. One sale of 1000 tons of Northern iron was made to a southern Ohio melter, but this is the only transaction of note in Northern foundry iron. There has been a comparatively large tonnage of speculative iron bought in the South and also some from the Hanging Rock producers. One agency reports a sale made last week of 5000 tons of Northern foundry. Southern furnaces have not yet definitely succeeded in establishing a higher price than $9.50, Birmingham basis, on prompt shipment iron, as a few makers are willing to take business for nearby delivery at this figure, but last half quotations universally range from $9.75 to $10. Both Northern foundry and malleable can be obtained for shipment through the year at $12.50 at furnace. The silvery irons are dull and quotations are unchanged. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft.	$12.90 to $13.40
Southern coke, No. 2 f'dry and 2 soft.	12.40 to 12.90
Southern coke, No. 3 foundry	11.90 to 12.40
Southern No. 4 foundry	11.40 to 11.90
Southern gray forge	10.90 to 11.40
Ohio silvery, 8 per cent. silicon	16.01 to 16.26
Southern Ohio coke, No. 1	14.76 to 15.26
Southern Ohio coke, No. 2	13.76 to 14.26
Southern Ohio coke, No. 3	13.51 to 13.76
Southern Ohio malleable Bessemer	13.76 to 14.01
Basic, Northern	13.76 to 14.01
Lake Superior charcoal	15.25 to 17.25
Standard Southern carwheel	26.90 to 27.40

(*By Mail*)

Coke.—Foundry coke shows some activity; a few consumers have covered their requirements for the last half of the year, and some of them for a 12 months' supply. Buyers have been slower this year in making provisions for their future needs than usual, and the majority of them are still somewhat apathetic and appear to believe that there is no danger of any near sharp advances in present quotations. It is reported that some of the Tennessee furnaces have contracted for a supply of 48-hr. coke, but the tonnage taken is not known. We quote Connellsville 48-hr. coke at $1.50 to $1.65 per net ton at oven. Foundry coke in the same district can be obtained as low as $2.15 for prompt shipment, but contract prices range from $2.40 to $2.50.

Finished Material.—The spelter situation has caused another advance in galvanized sheets, and 3.65c., Cincinnati or Newport, Ky., is now minimum on No. 28. Considerable prompt business is reported that is of a scattered nature, although the demand from the South appears to be on the increase. No. 28 black sheets are quoted at 1.85c. to 1.90c., Pittsburgh. Railroad track

material is showing some improvement. Hoops and bands are quiet. It is rumored that a large manufacturing company in this territory has put out inquiries for a round tonnage of forging steel bars, with shipments to be started at an early date. A later request has been issued for prices on 5000 tons of round steel bars that are wanted by a central Ohio manufacturer.

Old Material.—For some unaccountable reason very little scrap is changing hands at present. A few of the foundries bought quite freely ten days ago, but they are now only taking small quantities for immediate needs. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices, f.o.b. at yards:

Per Gross Ton

Bundled sheet scrap	$6.25 to	$6.75
Old iron rails	10.50 to	11.50
Relaying rails, 50 lb. and up	19.25 to	19.75
Rerolling steel rails	9.75 to	10.25
Melting steel rails	8.50 to	9.00
Heavy melting steel scrap	8.50 to	9.00

Per Net Ton

No. 1 railroad wrought	$8.50 to	$9.00
Cast borings	4.50 to	5.00
Steel turnings	4.50 to	5.00
Railroad cast scrap	9.00 to	9.50
No. 1 machinery cast scrap	10.25 to	10.75
Burnt scrap	6.50 to	7.00
Old iron axles	13.50 to	14.00
Locomotive tires (smooth inside)	8.50 to	9.00
Pipes and flues	5.75 to	6.25
Malleable and steel scrap	7.00 to	7.50
Railroad tank and sheet scrap	5.00 to	5.50

Birmingham

BIRMINGHAM, ALA., May 10, 1915.

Pig Iron.—Inquiry is still brisk, but the current volume of business does not compare with that done in April. The quotation of $10 is maintained by some interests, but not yet by all. There has been a sale in local territory of 1000 tons to cover the last half at $10, and a lot of 2000 tons for delivery from June to December in competitive territory is also on the $10 list. A leading interest declares that it has secured $10 for several lots, but it also admits the loss to others of contracts which there is reason to believe were placed below this price. It is admitted by one company that it has recently sold iron for prompt delivery on the basis of $9.75, but the same interest is quoting nothing under $10 for the last half. An unbiased analysis of the situation would seem to suggest that there is still some $9.75 prompt iron to be had, the general basis remaining at $10. The furnaces in Tennessee will, of course, sell their iron on the $9.75 Birmingham basis on account of the differential in the freight rates, and this would also be possible for extreme northern Alabama metal. The April business done by the Birmingham furnaces foots up a round total of about 400,000 tons on the final showing. One concern sold 115,000 tons; another, over 112,000 tons; a third, over 100,000 tons, and a fourth, 86,000 tons, while the two remaining smaller interests must have sold 20,000 tons. These are admitted figures in the best-informed iron circles. The make for two months has been under 140,000 tons per month. The stocks in yards are still to be considered. While they were reduced about 20,000 to 25,000 tons in April, they still foot up somewhere around 230,000 tons of free foundry, besides accumulations of warrant iron, basic, etc. It is these accumulations which will tend to retard any great increase in the output. However, the Tennessee Coal, Iron & Railroad Company has blown in a stack at Ensley and the Sloss-Sheffield Steel & Iron Company announces the early blowing in of its Philadelphia stack at Florence, together with resumption at Bessie mines and coke ovens at Brookside and Blossburg. Charcoal iron is responding in sympathy to foundry and the industry is more brisk. Shelby furnace is to resume May 15. The Ensley steel works of the Tennessee Company will continue for the present on the same schedule, which amounts to 60 per cent. of capacity. We quote for prompt delivery by some interests and for the second half, per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 1 foundry and soft	$10.25 to	$10.50
No. 2 foundry and soft	9.75 to	10.00
No. 3 foundry	9.25 to	9.50
No. 4 foundry	9.00 to	9.25
Gray forge	8.75 to	9.00
Basic	9.75 to	10.00
Charcoal	22.50 to	23.00

Cast-Iron Pipe.—The demand for water and gas pipe is reported as very good, with plants active and the prospect satisfactory. The principal order of the week was for 3000 tons of gas pipe for the Birmingham Railway, Light & Power Company, secured by the Bessemer plant of the leading interest. Far Western business is also reported. The sanitary pipe shops are experiencing a fair domestic business and have secured some foreign contracts, notably one for Porto Rico. We quote, per net ton, f.o.b. pipe shop yards, as follows: 4-in., $20; 6-in. and upward, $18, with $1 added for gas pipe.

Coal and Coke.—Coke is in better demand and the market will further expand with the renewal of furnace operations. Far Western shipments continue. The Woodward Iron Company will soon have the additional Koppers ovens completed, which are now being built at Woodward. We quote, per net ton, f.o.b. oven, for beehive coke as follows: Furnace, $2.75 to $3; foundry, $3.20 to $3.40, with best brands bringing a higher price. Coal is looking up to some extent, but mine operations continue on a 60 per cent. basis.

Old Material.—The market is benefiting from the brisker tone in the pig-iron trade, with the demand for steel scrap quite good. Consumers' stocks are still from hand to mouth, however. Prices are comparatively well maintained. We quote, per gross ton, f.o.b. dealers' yards, as follows:

Old iron axles	$13.00 to	$13.50
Old steel axles	12.50 to	13.00
Old iron rails	12.50 to	13.00
No. 1 railroad wrought	8.50 to	9.00
No. 2 railroad wrought	7.50 to	8.00
No. 1 country wrought	8.00 to	8.50
No. 1 machinery cast	8.25 to	8.50
No. 1 steel scrap	8.00 to	8.25
Tram carwheels	8.25 to	8.50
Stove plate	7.00 to	7.50

St. Louis

ST. LOUIS, MO., May 10, 1915.

Pig Iron.—A further increase in activity has developed. Sales reported for the week aggregate about 5000 tons, practically all No. 2 and No. 3 Southern foundry. Reports, which cannot be verified, speak of considerable sales aggregating perhaps 15,000 tons more. The dealers reported as having closed the transactions referred to decline to deny the statements positively. The activity has been somewhat checked by the Lusitania disaster, which has caused timidity about future commitments, the present demand and all sales being for last half delivery.

Coke.—The market is showing some signs of life, as consumers are beginning to make contracts for the new year, beginning July 1. Some few transactions of this nature have been closed, but no large ones are yet included. By-product coke continues to be quoted at $5.10 per net ton, St. Louis delivery.

Finished Iron and Steel.—The aggregate of business taken holds up well, but orders are of small size. The largest transaction reported is 700 tons of reinforcing bars for the Santa Fe elevator at Topeka, Kan. Tank plates show some weakness. An order for 1200 tons of rails was placed by the Missouri, Kansas & Texas, but the feeling is that other roads will not enter the market before the close of their fiscal year, June 30. Track fastenings are in fair request. Agricultural implement houses are reported fairly busy, but vehicle plants are rather slow in their demand for new material. The structural contract for the St. Louis municipal bridge, requiring about 24,000 tons, is not expected to be awarded before June 1. Movement out of warehouse continues heavy. We quote for stock out of warehouse: Soft steel bars, 1.70c.; iron bars, 1.65c.; tank plates, 1.80c.; structural material, 1.80c.; No. 10 blue annealed sheets, 2c.; No. 28 black sheets, cold rolled, one pass, 2.55c.; No. 28 galvanized sheets, black sheet gauge, 3.85c., this latter being the only advance for the week.

Old Material.—There has been less activity than ever, and not even the dealers are doing any trading. The uncertainty of the market has been increased by the war developments and no one is willing either to buy or sell. In consequence quotations are nominal, with the tendency toward a lower range. Lists now out include 1800 tons from the Missouri, Kansas & Texas and 4000 tons from the Southern. We quote dealers' prices, f.o.b. St. Louis, as follows:

	Per Gross Ton	
Old iron rails	$10.25 to	$10.75
Old steel rails, re-rolling	9.75 to	10.25
Old steel rails, less than 3 feet	10.75 to	11.25
Relaying rails, standard section, subject to inspection	22.00 to	23.00
Old carwheels	9.00 to	9.50
No. 1 railroad heavy melting steel scrap	9.00 to	9.50
Shoveling steel	8.00 to	8.50
Frogs, switches and guards cut apart	9.00 to	9.50
Bundled sheet scrap	5.75 to	6.00
	Per Net Ton	
Iron angle bars	$10.25 to	$10.75
Steel angle bars	8.00 to	8.50
Iron car axles	13.75 to	14.00
Steel car axles	9.75 to	10.25
Wrought arch bars and transoms	11.00 to	11.50
No. 1 railroad wrought	7.75 to	8.25
No. 2 railroad wrought	7.75 to	8.25
Railroad springs	8.00 to	8.50
Steel couplers and knuckles	8.00 to	8.50
Locomotive tires, 42 in. and over, smooth inside	8.75 to	9.00
No. 1 dealers' forge	7.00 to	7.50
Mixed borings	4.75 to	5.25
No. 1 busheling	7.25 to	7.75
No. 1 boilers, cut to sheets and rings	6.00 to	6.50
No. 1 railroad cast scrap	8.00 to	8.50
Stove plate and light cast scrap	6.50 to	7.00
Railroad malleable	6.00 to	6.50
Agricultural malleable	5.50 to	6.00
Pipes and flues	5.75 to	6.25
Railroad sheet and tank scrap	6.00 to	6.50
Railroad grate bars	6.50 to	6.75
Machine shop turnings	5.00 to	5.50

San Francisco

SAN FRANCISCO, CAL., May 5, 1915.

Rails.—Small orders are much more numerous, and a very fair tonnage of light rails has been placed the past month, some stocks that have long been held here being about cleaned out. A good many orders for rails up to about 40-lb. have also been placed by lumber interests, but the tonnage is below normal, and there is little inquiry for heavier sections. Second-hand rails are being used for some good sized projects.

Plates.—The general contract for the Sacramento water system, requiring about 1500 tons of plates, has been let to the Schaw-Batcher Company. The town of San Bernardino has divided a contract for 10,200 ft. of 12 and 20 in. riveted pipe between the Western Pipe & Steel Company and the Baker Iron Works. The Union Oil Company plans improvements to its plant near Richmond to cost about $600,000. Shipbuilding work, both at local plants and at the Mare Island Navy Yard, is taking a very fair tonnage.

Sheets.—Mill agents report rather dull business, as the demand for black and blue annealed sheets has not made much headway, while all orders for galvanized have to be put up to the mills for acceptance, with a firmer feeling than before as to prices. Consuming requirements, though expanding, have been below expectations.

Wrought Pipe.—A slight improvement is noted in some quarters, but comparatively little business is going to the mills, as few large single inquiries are appearing.

Pig Iron.—The foundry trade is still quiet, and the pig-iron situation is in rather uncertain condition, though old stocks of foreign iron are gradually being worked off. About the only foreign iron arriving of late has been from the Orient, mainly Calcutta, which was sold prior to arrival. Some recent sales of foreign iron, corresponding to No. 1 foundry, have been reported at $21 to $22 per net ton.

Coke.—The outlook for further offerings of foreign foundry coke is very doubtful. One cargo is long overdue, and another has been loaded but has not yet left England. Spot offerings move slowly, and are still fairly large, but are held at advancing prices, some dealers quoting as high as $14 per net ton. A few small lots of domestic coke from various sources are coming in, but it is impossible to get a definite line on prices.

Old Material.—The scrap market remains lifeless. Cast-iron scrap is still held within the old range of $14 to $16 per net ton, with a light but steady demand, while steel melting scrap is irregular. Buying by the steel mills is confined to such odd lots as can be picked up at their own prices, occasional purchases being made by small melters at about $8 per gross ton.

New York

NEW YORK, May 12, 1915.

Pig Iron.—Very little has been done locally in the past week and the New England situation is also quiet. The increased firmness of the Southern pig-iron market has not communicated itself to Northern iron, and some instances of shaded prices have come up in the competition of various Eastern makers. In the Lehigh Valley one Crane furnace that has been idle for several months may start up, now that a decision has been given by a State commission on the freight rate tangle that resulted from the purchase of the Crane Railroad by the Lehigh and New England Railroad. For a time no coke rate into Catasauqua was published by the through lines. There is no increase in the melt of foundry iron, but as the ramifications of war business increase machine tool castings will figure more largely in the consumption of foundry grades. Recently some fair amounts of charcoal pig iron were taken by Eastern buyers. We quote as follows, at tidewater: No. 1 foundry, $14.50; No. 2 X, $14 to $14.25; No. 2 plain, $13.75 to $14; Southern iron, $14.25 to $14.50 for No. 1 and $14 to $14.25 for No. 2.

Ferroalloys.—The Grecia and the Larchmore are reported to have reached this side the last of last week which, together with the arrival of the Appenine today, makes the estimated receipts of ferromanganese in the week about 4000 to 5000 tons. Other amounts are reported as on the way. The total received thus far is not much short of 8000 tons. The market is very quiet, there being little demand for forward delivery or even for spot material. The quotation remains at $88, seaboard. Spiegeleisen is fairly active at about $27 for 19 to 21 per cent. at the furnace, and producers are quite well sold for most of the year. Ferrosilicon, 50 per cent., is in good demand at the ruling quotation, $71 to $73 Pittsburgh.

Structural Material.—Interest attaches to the recent rather frequent contracts for buildings, for which the fabrication and erection are specified to be the earliest time possible. In addition to the enlargement of the plants of the Remington Arms Company, commented on recently, and of the Scoville Mfg. Company, reported last week, both of which were required to be completed in about eight weeks, the Baldwin Locomotive Works awarded in the last week a contract for a new building for its plant at Eddystone, Pa., involving 8000 tons to the McClintic-Marshall Construction Company, stipulating that it be finished in 10 weeks. It is understood that this and the other contracts of this nature are for the filling of war contracts in the first instance and for general expansion later. These rush orders have been taken at unusually low prices. The market shows slowness in the development of new projects. In the week fabricators have been asked to bid on 1500 tons for a new train shed of the Bush type for the Lehigh Valley passenger station at Buffalo; on 1500 tons for the Radley loft on West Twenty-eighth street for the Caxton Printing Company; on 500 tons for the Burton Building, Twenty-ninth street and Fifth avenue, and on 1000 tons for the Foster building at East Fortieth street and Madison avenue to be used by the National School of Correspondence. The Pennsylvania Railroad has put out inquiries for about 750 tons for various small bridges which, together with the specifications which it already has before the market, bring the total to about 2000 tons. In the last week, in addition to the 8000 tons reported

above as contracted for by the Baldwin Locomotive Works, awards have been made for about 5000 tons as follows: 1200 tons to the Lackawanna Bridge Company for the Lehigh Valley passenger station at Buffalo, for which J. Henry Miller of Baltimore is the general contractor; 1100 tons to the American Bridge Company for the Boston & Maine at Bardwell, Mass.; 700 tons to the Hinkle Iron Works for the 12-story loft for the Number Forty East Thirtieth Street Construction Company; 500 tons to the W. B. Shafer Company for a building on East Fiftieth street for the Grand Rapids Furniture Company; 900 tons to Levering & Garrigues for a National bank building at Springfield, Mass., for which Hoggson Brothers are the general contractors, and 700 tons to the New England Structural Company for a grandstand at the baseball park in Boston. We quote mill shipments at 1.20c., Pittsburgh, or 1.369c., New York, and from store, 1.85c. to 1.90c., New York.

Plates.—Representatives here of plate makers say that their mills are averaging 75 per cent. of capacity. Domestic business in this market is not made up of large contracts, though small orders are running into fair tonnages. Export inquiries are numerous, but are not developing promptly into orders, though one interest is taking considerable such business at 1.21c. base, New York. The Pressed Steel Car Company has not taken an order for 10,000 or any number of cars for Russia, despite persistent rumors. Two orders for Russia have been placed, however, as follows: 2000 box cars with the Eastern Car Company, Glasgow, Canada, and 2000 box cars with the Canadian Car & Foundry Company. There is some doubt as to the recent large inquiry of the Pennsylvania Railroad and Lines West, amounting to over 16,000 cars, resulting in buying in the near future. The bids on all these cars went in early this week. The Chicago & Northwestern has awarded a contract to the Western Steel Car & Foundry Company for 2000 freight cars and it is understood that 1000 more will be bought shortly. The Virginian Railroad placed an order for 500 steel underframes with the Greenville Steel Car Company, Greenville, Pa., and the Ponca Refining Company is reported to have ordered from the American Car & Foundry Company 120 tank cars. New inquiries reported as being submitted to car builders are the following: 150 40-ft. flat cars of 80,000 to 100,000 lb. capacity by the Pennsylvania Equipment Company; 300 refrigerator cars by the Cold Blast Transportation Company, and 1000 coal cars for the Western Maryland Railroad. It is understood that the Rock Island is considering the purchase of 5000 cars. We quote steel plates at 1.15c. to 1.20c., Pittsburgh, or 1.319c. to 1.369c., New York, and from store, 1.85c. to 1.90c., New York.

Iron and Steel Bars.—The Lusitania catastrophe is connected with some cessation in the specifications on contracts for steel bars, which for some time had been getting better. The general effect on business of the event uppermost in men's minds is hard yet to gauge. Export demand continues good. An interesting feature of this trade is that specifications on one order for 27,000 tons of bars for shrapnel contain maximum limits on nickel and other elements not usually found in such material. The specifications closely follow those used in England. Orders for bar iron are reported to be only fair in the last week, with very little change in the price situation. We quote mill shipments of steel bars at 1.20c., Pittsburgh, or 1.369c., New York, and refined iron bars, 1.20c. to 1.25c., New York. Out of store in New York iron and steel bars are 1.80c. to 1.85c.

Cast-Iron Pipe.—The pipe for the city of Newark, N. J., on which bids were opened May 6, was awarded partly to the United States Cast Iron Pipe & Foundry Company and partly to the Standard Cast Iron Pipe & Foundry Company, except the high pressure pipe, which was given to R. D. Wood & Co. The Department of Water Supply, Gas and Electricity of the city of New York will open bids May 20 on a contractor's pipe-laying job for the borough of Manhattan, involving the purchase of about 700 tons of a variety of sizes running from 6 to 48 in. Private buying is well sustained, while prices continue quite firm. Carload lots of water pipe, class B and heavier, are quoted at $22 to $22.50 per net ton, tidewater, for 6-in., while class A and gas pipe command an extra of $1 per ton.

Old Material.—The local market has not participated to any extent in the better business reported in eastern Pennsylvania, except that shipments are going forward more freely on contracts. Dealers, however, have been accumulating stocks a little more liberally in the expectation that an improved demand will shortly be experienced here. Prices are firm. Brokers' quotations to local dealers and producers, per gross ton, New York, are as follows:

Old girder and T rails for melting	$9.00 to $9.25
Heavy melting steel scrap	9.00 to 9.25
Relaying rails	19.00 to 19.50
Rerolling rails (nominal)	9.00 to 9.25
Iron car axles (nominal)	15.25 to 15.75
Steel car axles (nominal)	11.75 to 12.25
No. 1 railroad wrought	10.50 to 10.75
Wrought-iron track scrap	9.50 to 9.75
No. 1 yard wrought, long	9.50 to 9.75
No. 1 yard wrought, short	9.00 to 9.25
Light iron	3.25 to 3.75
Cast borings	5.50 to 5.75
Wrought turnings	6.00 to 6.25
Wrought pipe	8.00 to 8.25

Foundries are not buying more heavily, but some who have asked dealers to withhold shipments are again receiving deliveries. Quotations to consumers on cast scrap are as follows, per gross ton, New York:

Old carwheels	$9.25 to $9.50
No. 1 heavy cast, broken up	11.50 to 11.75
Stove plate	8.00 to 8.25
Locomotive grate bars	7.50 to 8.00
Malleable cast (railroad)	8.00 to 8.35

Boston

BOSTON, MASS., May 11, 1915.

Old Material.—Neither users, producers nor dealers look for any material change in prices of scrap in the immediate future, though the tendency should be upward if anything. A steady volume of business is proceeding, but it is not great. The New England foundries are somewhat busier than they have been, because of the demands of the machine-tool people, due to war orders, but as a whole this branch of industry permits of improvement. The quotations given below are based on prices offered by the large dealers to the producers and to the small dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates from eastern Pennsylvania points. Mill prices are approximately 50c. per ton higher.

Heavy melting steel	$8.25 to $8.50
Low phosphorus steel	13.75 to 14.75
Old steel axles	12.75 to 13.25
Old iron axles	20.25 to 20.75
Mixed shafting	12.00 to 12.25
No. 1 steel wrought and soft steel	8.25 to 8.75
Skeleton (bundled)	5.50 to 5.75
Wrought-iron pipe	7.00 to 7.50
Cotton ties (bundled)	5.25 to 5.75
No. 2 light	3.25 to 3.75
Wrought turnings	5.00 to 5.50
Cast borings	5.00 to 5.25
Malleable	7.50 to 7.75
Stove plate	7.00 to 7.50
Grate bars	5.25 to 5.50
No. 1 machinery cast (price to consumer)	13.00 to 13.50
No. 2 machinery cast (price to consumer)	11.50 to 12.00

The Electric Materials Company, North East, Pa., has been organized with a capital stock of $100,000 for the manufacture of street railway repair parts, commutators, trolley wheels, line material, steel and copper drop forgings, making a specialty of high grade copper, bronze and brass castings. The present plant is to consist of a machine shop, 35 x 120 ft.; forge shop, 40 x 90 ft.; foundry, 40 x 90 ft., and power house, 24 x 66 ft. The officers of the company are: George E. Pierce, president; F. B. Moorhead, vice-president; O. C. Hirtzel, treasurer and general manager; N. P. Fuller, secretary, and H. F. Eaton, chief engineer. Mr. Hirtzel was formerly treasurer and general manager of the Eureka Company, North East, Pa., and at one time was connected with the Westinghouse Electric & Mfg. Company. Mr. Eaton also was formerly with the Westinghouse Company. The company has placed orders for from 20 to 30 machine tools.

British Market Quiet

Pig Iron Easier and Lower—Sales of Alabama Steel Blooms

(*By Cable*)

LONDON, ENGLAND, May 12, 1915.

The pig-iron market shows an improved tendency owing to export permits being issued more freely. General buying, however, is still poor. The tendency of hematite iron is dull. Furnaces in blast are 166 compared with 168 a year ago. Stocks of pig iron in Connal's stores were 145,205 tons at the close of last week, against 144,210 tons one week previous. There is not much business doing in semi-finished steel, but the tone is very firm. Consumers are ready buyers at £6 10s. ($31.63), but the sellers ask £6 15s. ($32.85).

There have been some fair sales of Alabama blooms at about £6 5s. ($30.42), c.i.f. Wales. Finished steel is very firm with prices still tending upward. Tin plates are strong. We quote as follows:

Tin plates, coke 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 18s. ($4.38), against 17s. 9d. ($4.32) last week.

Cleveland pig-iron warrants, 64s. 11d ($15.79), against 65s. 4d. ($15.90) a week ago.

No. 3 Cleveland pig iron, makers' price, f.o.b. Middlesbrough, 65s. ($15.82), compared with 65s. 9d. ($16) a week ago.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £11 5s. ($54.75).

Steel ship plates, Scotch, delivered local yards, £9 15s. ($47.44).

Steel rails, export, f.o.b. works port, £8 2s. 6d. ($39.54), compared with £8 ($38.93) last week.

Hematite pig iron, f.o.b. Tees, 102s. 6d. ($24.94).

Sheet bars (Welsh), delivered at works in Swansea Valley, £7 ($34.06).

Steel joists, 15 in., export, f.o.b. Hull or Grimsby, £9 10s. ($46.23).

Steel bars, export, f.o.b. Clyde, £10 5s. ($49.88), against £10 2s. 6d. ($49.27), a week ago.

Ferromanganese, f.o.b., £17 15s. ($86.38).

Ferrosilicon, 50 per cent., c.i.f., £14 ($68.13).

Metal Market

NEW YORK, May 12, 1915.

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York			Lead		Spelter	
May	Lake	Electrolytic	Tin, New York	New York	St. Louis	New York	St. Louis
5	21.00	18.62½	38.50	4.20	4.07½	14.50	14.25
6	21.00	18.75	38.75	4.20	4.07	14.50	14.25
7	21.00	18.75	39.50	4.20	4.10	14.50	14.25
8	21.00	18.75	42.00	4.20	4.10	14.50	14.25
10	21.00	18.75	40.50	4.20	4.10	14.25	14.00
11	21.00	18.75	40.00	4.20	4.10	14.25	14.00

Copper is quieter but strong. Tin advanced with a big movement last week then became easier. Lead is unchanged except for a little more strength in the West. Spelter continues strong with spot supplies extremely scarce. English brands of antimony are practically unobtainable and Chinese is higher.

New York

Copper.—Both foreign and domestic demand is quieter, but there are rumors of impending activity involving large quantities. Of late the producers of electrolytic have been getting an increasing share of the war business, despite the preference for Lake on the part of those having war contracts. The growing scarcity of the latter has compelled the use of electrolytic in many cases. Some of the electrolytic producers are holding to 19c., full terms, but at least a limited quantity can be had from second hands at from 18.75c. to 18.87½c., cash, New York. Large quantities of special Lake have been sold at 23c., cash, while less favored brands of prime Lake were obtainable down to 21c. Some of the metal which is offered at 21c. was withdrawn and sold at higher prices in good-sized quantities. Exports this month total 10,724 tons.

Tin.—The market was quiet up to last Friday when news of the destruction of the Lusitania was received. Fears for the future of shipping started a buying movement which lasted through Saturday and caused at least 800 tons to change hands in the two days. All positions were dealt in, although there was comparatively little done in far futures or metal afloat. It was expected that the week-end activity here would cause a sharp advance in London, but this did not materialize and the market here became easier again. The greater business of the two days was done on Saturday. The quotation yesterday was 40c. The arrivals this month total 910 tons and there is afloat 4875 tons, a large proportion of which is coming from London.

Lead.—The foreign demand has slackened and the domestic is light. There is some inquiry for rather large lots for export but these are fewer and smaller than those of preceding months. Home buyers are satisfied to take small quantities and show no disposition to stock up. A peculiarity of the situation is that the buyer of carload lots can get 4.10c., f.o.b. St. Louis, while the purchaser who wants 1000 tons must pay 4.15c. f.o.b. St. Louis. The reason for this is that the small buyers are regular customers and can be easily cared for, while most of those who want large quantities are mostly outsiders buying for unusual purposes, The quotation in New York yesterday was 4.20c., and that at St. Louis, 4.10c. Sellers are well-booked ahead. Exports this month total 3292 tons.

Spelter.—The market is quieter although there still are some inquiries, excellent in point of size, before the trade. Spot and prompt delivery continue scarce. The foreign inquiries are fewer although exports this month total 1769 tons. The quotations yesterday were 14.25c., New York, and 14c., St. Louis. Because of the scarcity precise quotations for spot are difficult to obtain.

Antimony.—English brands are practically out of the market, although there are instances where small resale lots have brought from 40c. to 45c. Chinese and Japanese have sold at 35c. in bond, or at about 38.50c., duty paid. These brands are scarce also and further worry has been caused by fear of Chinese-Japanese complications.

Old Metals.—The market continues quiet. Dealers' selling prices are nominally unchanged, as follows:

	Cents per lb.
Copper, heavy and crucible	17.00 to 17.50
Copper, heavy and wire	16.50 to 17.00
Copper, light and bottoms	14.00 to 14.50
Brass, heavy	11.00 to 11.50
Brass, light	8.50 to 9.00
Heavy machine composition	13.25 to 13.75
No. 1 yellow rod brass turnings	10.25 to 10.75
No. 1 red brass or composition turnings	11.00 to 11.25
Lead, heavy	3.75
Lead, tea	3.50
Zinc, scrap	8.00

St. Louis

MAY 10.—Uncertainty continues in non-ferrous metals and prices made are good only for the moment of making. Lead is quotable at 4.25c.; spelter, 14.50c.; tin, 43c.; Lake copper, 18.50c.; electrolytic copper, 18.25c.; antimony, 40c., this latter having gone out of reach practically in this market. In the Joplin district prices of zinc ore held the firmest in the history of the camp for a few days, with the basis range $69 to $75 per ton and the top settlement $78. This was the situation up to Friday night, when all bids were ordered off as a result of the Lusitania disaster. Calamine continued high at $44 to $47.50, while the choicest grades brought as high as $52. Lead ore remained unchanged at $51. Scrap metal quotations are scarcely reliable for the same reasons as exist in the other metal markets, but the best figures obtainable today are as follows: Light brass, 8.75c.; heavy yellow brass, 9.75c.; heavy red brass and light copper, 12.25c.; heavy copper and copper wire, 15c.; tinfoil, 35c.; pewter, 25c.; lead, 3.60c.; zinc, 9c.; tea lead, 3.25c.

Negotiations were closed May 11 for the sale of the Cleveland Clutch Company to the Reliance Gauge & Column Company, 5902-5912 Carnegie avenue, Cleveland, Ohio. The latter recently completed a new five-story factory building and will very soon be equipped to push the clutch and pulley business.

Iron and Industrial Stocks

NEW YORK, May 12, 1915.

The downward tendency in the stock market, which began early this month, was greatly accelerated on several days of the past week, following the sinking of the Lusitania on Friday, May 7. In numerous stocks the declines were quite heavy, and the slump was not checked until Tuesday. Since then the recovery has been sharp. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com..	12⅛ - 17¼	Nat. Enam. & St., pref.	83
Allis-Chal., pref..	38 - 51	Pressed Stl., com.	40 - 50½
Am. Can, com...	29 - 41⅞	Pressed Stl., pref.	99¾ - 99⅞
Am. Can, pref...	93¼ - 99¼	Ry. Spring, com.	25¼ - 35¾
Am. Car & Fdy., com.	46⅞ - 56½	Ry Spring, pref.	92
Am. Car & Fdy., pref.	115⅛	Republic, com...	24 - 30¼
Am. Loco., com..	39¼ - 55	Republic, pref...	82 - 86
Am. Loco., pref..	95½ - 97½	Rumely Co., com.	4 - 6¼
Am. Steel Fdries.	30 - 35	Rumely Co., pref.	11 - 18
Bald. Loco., com.	38 - 53¾	Sloss, com.....	33 - 35
Bald. Loco., pref.	100 - 101½	Sloss, pref.....	85
Beth. Steel, com.	126 - 149½	Pipe, pref.....	44
Beth. Steel, pref.	110½ - 111⅝	U. S. Steel, com.	48¼ - 59⅛
Colorado Fuel...	23½ - 31⅝	U. S. Steel, pref.	104½ - 108½
General Electric.	147¾ - 157¼	Va. I. C. & Coke.	39 - 42
Gt. No. Ore Cert.	29 - 36½	West'gh'se Elec..	80¼ - 103¼
Int. Harv. of N. J., com.	90 - 98	Am. Ship, com...	35 - 36
Int. Harv. of N. J., pref.	98⅛	Chic. Pneu. Tool.	51 - 60¼
Int. Harv. Corp., com.	70 - 70½	Cambria Steel...	46 - 49¾
Int. Harv. Corp., pref.	102¼	Lake Sup. Corp..	6⅝ - 7½
Int. Pump, com..	5 - 6⅝	Pa. Steel, pref...	50 - 52½
Lackawanna Stl.	40 - 47	Warwick	9½
Nat. Enam. & St., com.	14 - 17½	Cruc. Steel, com.	19 - 25⅞
		Cruc. Steel, pref.	84½ - 88
		Harb.-Walk. Ref., com.	48
		Harb.-Walk. Ref., pref.	98 - 99

Dividends

The Niles-Bement-Pond Company, regular quarterly, 1½ per cent. on the preferred stock, payable May 15.

The Pratt & Whitney Company, regular quarterly, 1½ per cent. on the preferred stock, payable May 15.

The American Radiator Company, regular quarterly, 1¾ per cent. on the preferred stock, payable May 15, and regular quarterly, 4 per cent. on the common stock, payable June 30.

The International Nickel Company, regular quarterly, 5 per cent. on the common stock, payable June 1.

Deere & Co., regular quarterly, 1¾ per cent. on the preferred stock, payable June 1.

The Maxwell Motors Company, initial quarterly, 1¾ per cent. and an extra of ¾ of 1 per cent. on the first preferred stock, payable July 1. About 15 per cent. of accumulated dividends is in arrears.

Pittsburgh and Nearby Districts

At a special meeting of directors of the Westinghouse Electric & Mfg. Company, held last week, it was decided to issue new convertible 5 per cent. debenture gold bonds to the amount of $19,500,000. The holders of the first 5 per cent. sinking fund bonds, which issue amounts to $19,476,000, will be permitted to exchange their old bonds for the new ones, which will be convertible into stock when the latter reaches $110. The old bonds were not convertible until the old stock reached $200. In the circular to stockholders the directors state that the company will not require more capital for its present volume of business or for any increase expected in the near future, having made ample provision for present needs.

J. V. Thompson, the extensive coal and coke operator, for whom a receiver was appointed some time ago, states that he has about completed plans for securing $15,000,000 to $20,000,000 to meet his obligations. He also states that the First National Bank of Uniontown, Pa., of which he was president, and which closed its doors at the time of his failure, will reopen at an early date.

The Pittsburgh Steel Company, of which D. P. Bennett is vice-president and treasurer, has issued a statement showing that its gross sales for nine months ended March 31, 1915, were $7,560,588.40, against gross sales of $8,051,474.75 for the nine months ended March 31, 1914, showing a decrease of $490,886.35. The net profit for the nine months ended March 31, 1915, is given as $291,484.35, against $230,493.70 for the nine months ended March 31, 1914, which is an increase of $60,990.65.

The Youngstown Iron & Steel Company, Youngstown, Ohio, has placed additional contracts for equipment for its new open-hearth plant. These include an order given to the Nazel Engineering Company, Philadelphia, for a motor-driven Beche forging hammer, with a capacity for forging up to 5 x 5 in. billets. Also a contract placed with the A. S. Cameron Steam Pump Works, New York City, for two centrifugal hydraulic high pressure pumps, each to deliver 600 gal. per min. at a pressure of 550 lb., and two general service pumps with a capacity of 1,000,000 gal. per day each, also a standpipe 40 ft. high with the Knox Pressed & Welded Steel Company, Pittsburgh, and tank for hydraulic steam and steel pouring platform with the William B. Pollock Company, Youngstown. Covers and operating mechanism for the soaking pits were awarded to the Youngstown Foundry & Machine Company, Youngstown, and a large contract for ingot molds was given to the Wheeling Steel Casting Company, Wheeling, W. Va.

The mills of the Carnegie Steel Company at Greenville, Pa., have been put on double turn in all departments for the first time in more than a year. The output of the plant is largely steel skelp.

The two sheet mill plants of the Brier Hill Steel Company at Niles, Ohio, are running to full capacity this week, but the open-hearth steel plant is operating to only about 60 per cent.

The Youngstown Iron & Steel Company, Youngstown, Ohio, reports the receipt of heavy orders for black and galvanized sheets and it is now running eight out of nine sheet mills to full capacity. The idle mill will be started as soon as some repairs now being made on the heating and annealing furnaces are finished.

The Pittsburgh Steel Car Company has been organized largely by Pittsburgh capital, and has opened offices in room 512, Ferguson Building, in that city. The company is making plans for the erection of a large plant at Greenville, Pa., to build steel freight and passenger cars, with an estimated capacity of 7500 cars per year. It will be in the market for a large lot of equipment, the plans and details to be ready within two weeks. Temporary officers have been elected as follows: W. A. Scott, Jr., president; H. B. Scott and L. A. Meyran, vice-presidents; H. W. Best, treasurer; George W. Ramby, secretary, and E. B. Caughey, general manager.

The State Institution has awarded a contract for a motor-driven electric pump for the water supply at Polk, Pa., to the Alberger Pump Company, the lowest bidder. The commissioners of water works of Erie, Pa., have awarded a contract for a 40-ft. extension to the high service standpipe to the Pittsburgh-Des Moines Steel Company, Curry Building, Pittsburgh. All this work is under the supervision of Chester & Fleming, engineers, Pittsburgh.

Mary furnace of the Ohio Iron & Steel Company at Lowellville, Ohio, was put in blast on Monday, May 10. Out of 25 blast furnaces in the Mahoning Valley, 22 are in operation and three are idle, the latter being the two stacks of the Andrews & Hitchcock Iron Company, and Niles furnace, a small stack owned by the Carnegie Steel Company, which has not been operated for some years.

It is reported that the Federal Radiator Company has been organized with a capital of $600,000, and will build a new plant at New Castle. Pa., to manufacture steam and hot water boilers and radiators.

On Monday evening, May 17, a special train will leave the Union Depot, Pittsburgh, for Cincinnati, carrying members of the Natural Gas Association of America to attend the convention of the organization in that city, to be held May 18, 19 and 20. The Gibson House will be headquarters, and there will be exhibits in the music hall by the manufacturers and jobbers of pipe fittings.

OBITUARY

George T. Reiss

George T. Reiss, vice-president Niles Tool Works Company, Hamilton, Ohio, died May 5, after a lingering illness, aged 66 years. He was born in Cincinnati and located in Hamilton in 1877. His first employment was as a draftsman with the Niles Tool Works Company, which had a short time previously removed to Hamilton from Cincinnati. A year later he was placed in charge of the engineering department, then was made superintendent of the drafting department, and was subsequently elected as a member of the board of directors, of which he was also secretary. Upon the death of the late Col. Alexander Gordon and the accession of James K. Cullen to the presidency of the company, Mr. Reiss became vice-president. In addition to being a director in the Niles Tool Works Company, he was also a director in the Niles-Bement-Pond Company, an allied company. He was a prolific inventor and held the rights to many patents for machine tools and machinery. It is stated that his mechanical as well as executive ability was in a large measure responsible for the success of the company of which he was vice-president. He was greatly interested in public affairs, and was for several years a member of the Hamilton City Council. He was also the first president of the Hamilton Chamber of Commerce. For over 20 years he served as a member of the board of trustees of the Y. M. C. A.

GEORGE T. REISS

PATRICK J. MCARDLE, Albany, N. Y., died May 9, aged 67 years. He was born in Ireland and received his education there in a private school. He was brought to this country by his parents in 1862, the family locating in New York City. He secured employment in an iron manufacturing establishment shortly after and two years later engaged in the iron business at Oil City, Pa. Three years subsequently he started a foundry at Peekskill, N. Y., which he operated with marked success until about 1879, when he returned to New York City and established a rolling mill for the manufacture of merchant bars and horseshoe iron. In 1885 he removed to Albany, where he engaged in the old material trade, establishing a business which grew to large proportions. He was also actively engaged in a number of local enterprises. He leaves his widow, three sons and three daughters. One of his daughters is the wife of Michael Blake, New York City, who is also engaged in the old material trade.

Charles A. Plamondon

Charles Ambrose Plamondon, president of the A. Plamondon Mfg. Company, Chicago, on his way to England, where he had been engaged in the establishment of a new enterprise, met his death in the sinking of the Lusitania, May 7. In business primarily, also in politics and social affairs, Mr. Plamondon was one of the prominent citizens of Chicago and in connection with some phases of his activity as a foundryman had a national acquaintance. He was the first chairman of the Western Foundrymen's Association at its Chicago meeting in 1893 and was again chairman of the Chicago meeting of the American Foundrymen's Association in 1913. He was born in Ottawa, Ill., September 14, 1856. His father, Ambrose Plamondon, established in Chicago in 1859 the business which later was incorporated under its present name. After passing through the elementary schools, C. A. Plamondon entered his father's shop and learned the machinist's trade, and his business career has been continuously associated with the development of the company of which he was president. He was a past president of the Illinois Manufacturers' Association and had official connection with a number of manufacturing enterprises. He took a large interest in public affairs in Chicago, serving on the Chicago Library Board as member and president and also on the school board. As far as is known, Mrs. Plamondon, who accompanied her husband on board the Lusitania, was also lost. There are five children. Mr. Plamondon is also survived by two brothers, George Plamondon, vice-president of the A. Plamondon Mfg. Company, and A. D. Plamondon.

C. A. PLAMONDON

CHARLES C. LEWIS, for 28 years prominent in the wholesale hardware business at Springfield, Mass., died May 4, aged 56 years. He was born in New London, Conn., and began his career in the hardware trade with the local wholesale firm of Dudley & Stevenson. In 1887 he went to Springfield and established the business of which he was the head at the time of his death. He was president of the Charles C. Lewis Company, specializing in heavy hardware and iron and steel. In 1898 he served a term as alderman and at the time of his death was vice-president of the American Iron, Steel and Heavy Hardware Association, and was a member of various commercial and fraternal organizations. He leaves his widow and three children.

LLOYD B. HUFF, Greensburg, Pa., died May 5, from Bright's disease, aged 43 years. He was president of the Keystone Coal & Coke Company, Pittsburgh, McKeesport & Greensburg Railway Company, Westmoreland Hospital Association, Allegheny Company, and United Brick Company, and a director in the Acme Gas Company, First National Bank of Greensburg, Keystone Clay Products Company, Latrobe-Connellsville Coal & Coke Company and Westmoreland Building & Loan Association. He leaves his widow and two daughters.

ALEXANDER FOSTER, Philadelphia, Pa., died May 6, aged 76 years. For many years he was one of the owners of the Fairmount Steel Works. The city of Philadelphia took over the property for local improvements 11 years ago, when Mr. Foster retired. He leaves his widow, two daughters and a son.

PHILIP M. MALONEY, of the Allen Iron & Steel Company, Philadelphia, was killed by a Philadelphia & Reading Railroad train striking his automobile on a crossing near Ambler, Pa., May 5. He was 38 years old.

WILLIAM A. KETTENRING, for over 20 years secretary and manager of the Defiance Machine Works, Defiance, Ohio, died May 1, aged 54 years. He retired from the active business management of the company about three years ago.

DAVID M. PARRY, long a prominent manufacturer, at one time president of the National Association of Manufacturers, died May 12 at his home in Indianapolis, Ind.

PERSONAL

A. W. Vogt, chief statistician of the United States Steel Corporation, was given the title of assistant comptroller by an official announcement issued May 1. Mr. Vogt continues in charge of cost accounting matters and of manufacturing and operating statistics of costs, production and capacity.

Edward W. Parker, connected for many years with the United States Geological Survey, has resigned to accept a responsible position with the anthracite mining companies. As coal statistician of the Government since 1890, and as chief of the Division of Mineral Resources of the Geological Survey since 1908, Mr. Parker's contribution to the present standard of the annual report entitled, Mineral Resources, has been large and important. In his new connection he will continue his activities in lines on which he has long been regarded as authority. With Secretary Lane's approval, Director George Otis Smith has designated H. D. McCaskey as chief of the Division of Mineral Resources of the Survey to succeed Mr. Parker. Mr. McCaskey was a mining engineer in the Philippine Mining Bureau from 1900 to 1903 and chief of that bureau from 1903 to 1906, and has been a geologist of the Geological Survey since 1907 and section chief since 1912.

Fred A. Bigelow has been appointed general sales manager of the Carpenter Steel Company, with headquarters at Reading, Pa., succeeding John E. Sullivan, resigned. James W. Sederquist has been made Western sales manager to succeed Mr. Bigelow at the office and branch warehouse, 400 Lakeside avenue, N. W., Cleveland.

Charles Spalding, representative of the Gisholt Machine Company, Madison, Wis., who has heretofore made his headquarters at the company's Chicago office, is now located at Detroit and will make his headquarters there, taking care of Chicago territory the same as heretofore. His home address is 2161 West Grand boulevard, and his mail address is care the Detroit Athletic Club, Detroit, Mich.

E. St. Elmo Lewis, vice-president and general manager of the Art Metal Construction Company, has been elected president of the Board of Commerce of Jamestown, N. Y. His company is the largest industrial unit in the city.

A. R. Baylis, A. M. Houser, Julian Kennedy and W. F. White have been appointed additional members of the Committee on Hydraulic Flanges of the American Society of Mechanical Engineers. H. G. Stott is chairman of the committee.

Harry H. Cutler, inventor and manufacturer, vice-president of the Cutler-Hammer Mfg. Company and Cutler-Hammer Clutch Company, electric controlling devices, has moved his residence to Boston, Mass., from Milwaukee, where he has lived for many years. He was the founder of the two companies and retired as active head several years ago, assuming the position of vice-president so that his heavy financial interests would continue to be officially represented. Mr. Cutler is 55 years old, but it is stated that he intends to engage in further scientific research in the Massachusetts Institute of Technology, of which he is a graduate. He is credited with having been granted more patents on electric controlling devices than any other person in America.

E. E. Winship, formerly manager of the Cincinnati branch of Manning, Maxwell & Moore, Inc., has been appointed manager of the Cleveland branch, effective May 1. C. H. Overkamp, formerly of the Conover-Overkamp Machine Tool Company, Dayton, Ohio, has been made manager of the Cincinnati office.

R. S. Lord, vice-president Hope Engineering & Supply Company, Farmers Bank Building, Pittsburgh, will read a paper on "Pipe Couplings" before the mechanical section of the Engineers' Society of Western Pennsylvania, in its rooms in the Oliver Building on the evening of June 1.

H. E. Preston, formerly with the American Can Company and prior to that with the Felt & Tarrant Mfg. Company, Chicago, has joined the Gisholt Machine Company's periodograph sales force and is making his headquarters at the company's Chicago office, 208 South La Salle street.

The council of the American Society of Mechanical Engineers has appointed a local committee on meetings of the society at Worcester, Mass. It consists of P. B. Morgan, chairman; T. H. Reed, secretary; C. F. Dietz, F. W. Parks, and H. B. Fairfield.

M. C. Stuart has been appointed mechanical engineer at the United States Naval Engineering Experiment Station, Annapolis, Md. He was formerly assistant steam engineer at the Cambria Steel Company, Johnstown, Pa.

F. D. Taggart, formerly in the roll department of the United Engineering & Foundry Company, and for the last seven years superintendent of the roll foundry of the Illinois Steel Company at Joliet, has become connected with the Birdsboro Steel Foundry & Machine Company, Birdsboro, Pa., in the capacity of roll foundry superintendent.

R. C. Kirk, recently elected president of the La Belle Iron Works, Steubenville, Ohio, has also been elected a director, succeeding H. Franzheim of Wheeling, W. Va., who died recently.

L. B. Clark, formerly connected with the Strong, Carlisle & Hammond Company, Cleveland, Ohio, has opened an office and storeroom under the name of the Clark Machinery Company, at 717 Frankfort avenue, N. W., Cleveland, and will deal in new and second-hand machine tools.

J. L. Gough, formerly sales manager of the C. C. Wormer Machinery Company, Detroit, Mich., has become manager of the second-hand machinery department of the Strong, Carlisle & Hammond Company, Cleveland, Ohio.

Jesse M. Bircks has resigned the presidency of the Strawbridge & Chase Company, manufacturers of wire goods, Audubon, N. J. The following officers are now in active charge: Robert T. Korb, president; Henry H. Collins, vice-president; William H. H. Egee, secretary and treasurer.

The Franklin Institute, Philadelphia, announces its annual presentation of medals for Wednesday evening, May 19, at the hall of the institute. His Excellency Chevalier Van Rappard will receive, on behalf of the Royal Netherlands Government, the Franklin medal for Prof. Heike Kammerlingh Onnes. Thomas A. Edison will be also presented with the Franklin medal, while Samuel Insull will receive the sculptor's model of the Franklin medal. The address of the evening will be by Mr. Insull on "Electricity and Modern Industrial Growth." A reception will follow at the hall of the Historical Society of Pennsylvania to meet the distinguished recipients.

Machinery Markets and News of the Works

RAILROADS SHOW INTEREST

Flood of War Business Is Unabated

Danger of an Acute Shortage of Machine Tools is Growing — Many Intending Buyers Must Wait for Deliveries

Scattered instances of railroad buying and of further inquiry from that direction are disclosed by the markets in Chicago, Cincinnati and New York. Meanwhile the war business goes on unabated and there promises to be a genuine shortage of machine tools. In New York plant managers are concerned with the fact that they must wait months for machines which they would like to get promptly. The scarcity is extending to second-hand machines, many of which have been bought up for those engaged in making war materials and who could not get satisfactory deliveries on new tools. The demand is wider in that it is for a greater variety of machines. The tool builders themselves have been large purchasers and thus helped along their fellow manufacturers who do not make the machines most in demand. Throughout New England there is a pronounced improvement in metal working lines, the textile trade is busier and around Bridgeport skilled labor is scarce. Chicago notes some railroad buying, also that war buying on behalf of Canadian interests is unabated. Milwaukee reports that the manufacture of war munition is in full swing. Orders for shrapnel-making machinery continue to come out in large number in Cleveland and second-hand tools are in active demand. Railroad buying is looked for in Cincinnati and machinery of all kinds is moving actively. Conditions are better in the Central South, Texas and the Birmingham district. Numerous inquiries are appearing on the Pacific coast.

New York

NEW YORK, May 12, 1915.

Despite repeated publication of the fact that the war demand for machine tools was forcing deliveries more and more into the future many users of such tools are just waking to the fact that they cannot buy engine or turret lathes, milling machines, drilling machines and some others without waiting several months for them. Many manufacturers who want tools for ordinary industrial production are puzzled over the situation. They say they must have machines—but they cannot get them and they ask, where have they all gone? They have been oblivious to the fact that hundreds of tools have been purchased by single companies, and that some tool builders have received offers from dealers who would take over their entire production for months to come. It has not been necessary for any tool maker to accept any of these offers. Second-hand machines are becoming as scarce as new ones and, as a prominent seller remarked, if the demand keeps up there will be no machines of any kind to be had. Cases are mentioned where machines on fairly good deliveries were lost to intending purchasers because the latter waited only a few hours. Large orders—ordinarily the subject of extended negotiation—have been placed by telephone. With those who have war orders the question of getting deliveries as soon as possible is a troublous one.

Large purchases have been made in the past week by the Westinghouse Electric & Mfg. Company, which has a contract for rifle parts; the New York Air Brake Company, the Crucible Steel Company of America and the Remington Arms Company, among others, all for war business. The Hall Switch & Signal Company is contemplating buying.

Some makes of milling machines have been sold through November, and with other tools delivery in September and October is the best that can be done. As for inquiries, they are coming not only from the concerns which have subcontracts for war materials, but also from others who can get similar contracts if they have the necessary equipment. Again, war business is being sought by manufacturers of all kinds.

Meanwhile the domestic demand for miscellaneous equipment is distinctly better. Orders have been placed by the Rushmore Dynamo Works, Plainfield, N. J., the Simms Magneto Company, Bloomfield, N. J., the Long Island Railroad, and others.

Practically all of the makers of turret lathes and automatics have advanced their prices 10 per cent. or more. Sometimes it has been accomplished by imposing an extra charge for tools and equipment heretofore included with the machine. In the case of foreign orders the custom of requiring confirmed credit is now general and with some of the business 25 per cent. cash is required with the order.

Of course, it still remains true that some machine tools, boring mills, for instance, are not in normal demand, but machine tool builders themselves have purchased hundreds of thousands of dollars' worth of various machines.

The Baldwin Locomotive Works, Broad and Spring Garden streets, Philadelphia, Pa., has awarded contract for the construction of a one-story concrete and hollow tile factory with wood block floor, 900 x 1200 ft., to be erected at Eddystone, Pa., at a cost of $500,000.

The General Electric Company, Schenectady, is in the market for a wire-straightening machine and a number of radial drills.

The Duriron Castings Company, 90 West street, New York, has increased its capital stock from $50,000 to $300,000. It is adding a foundry to its plant at Dayton, Ohio. P. D. Schenck is president.

Gabriel & Schail, 205 Pearl street, New York, have broken ground for a plant, 135 x 225 ft., of reinforced concrete and hollow tile construction, to be erected at New Market, N. J., at an approximate cost of $100,000. This is the first building to be erected on a 12-acre factory site to be devoted to the manufacture of asphalt products, composition floors, etc.

John Thatcher & Son, 60 Park avenue, have received the general contract to erect a two-story foundry, 100 x 120 ft., in the south side of Fortieth street, 210 ft. east of Second avenue, for M. F. Hamsley Iron Works, foot of Thirty-sixth street, Brooklyn, N. Y. William Higginson, 13 Park row, Manhattan, is the architect. The cost will be about $40,000.

The Rowland Sound Regulator Company has been incorporated with a capital stock of $10,000 to manufacture a device for controlling sound on phonographs. The company will have dies made from which the device is to be made, but will not build a plant until some future time. Charles J. Pick is president. Harry Weinberger, 261 Broadway, New York, is the attorney.

The Hazleton Bleach Works, Hazleton, Pa., has had plans drawn for a two-story plant of concrete construction, 50 x 100 ft. The mechanical equipment will consist of boilers, engines, generators, elevator and special equipment.

Estimates for extensive improvements to the waterworks at Batavia, N. Y., and for changes in pumping equipment and the electric light system of that city are being prepared by Chester & Fleming, engineers, Pittsburgh, Pa.

The board of education, Syracuse, N. Y., of which A. E. Larkin is president, is taking bids for a boiler house and equipment, in connection with vocational high school which it is to erect.

The Brownyard Fireproof Door & Window Company, 367 Mill street, Rochester, N. Y., is having a fireproof factory erected for its occupation on the New York Central Railroad near Winton road.

Work on the new plant of the Essex Glass Company, Dunkirk, N. Y., is well under way and is being rushed as rapidly as possible so that manufacturing operations may be commenced July 1.

The Rochester Ice Cream Company, St. Paul street, Rochester, N. Y., will build and equip a three-story and basement ice cream plant, 100 x 120 ft., of reinforced concrete.

The Syracuse Heater Company, 409 Snow Building, Syracuse, is constructing an addition to its plant.

The Erdle Perforating Company, 171 York street, Rochester, has let contract for construction of a 60 x 66-ft. addition to its factory.

R. J. Strassenbergh & Co., manufacturing chemists, 195 Exchange street, Rochester, have let contract for the construction of a two-story factory.

The Utility Products Company, Buffalo, has filed articles of incorporation with a capitalization of $500,000 to manufacture roofing materials. Emile A. Rouse and W. Edward Winterbrenner, New York City; Hector McDonald, Ottawa, Ont., and Allen F. Barger and Rex T. Crandall, Sidway Building, Buffalo, are the directors.

The department of public works, Buffalo, N. Y., of which Francis G. Ward is commissioner, is receiving bids for an air compressor for the Porter avenue pumping station.

The Buffalo Corrugated Container Company, 25 Imson street, Buffalo, will enlarge its factory, Imson street and the Lehigh Valley Railroad, for the manufacture of fiber containers.

The Buffalo Copper & Brass Rolling Mill Company, Buffalo, at Military road and the New York Central Railroad, will build further additions to its plant, 65 x 156 ft., three stories, and 56 x 144 ft., two stories, of brick and steel construction.

The H. H. Franklin Mfg. Company, Syracuse, N. Y., will build a three-story addition, 56 x 80 ft., to its automobile factory at Marcellus and South Geddes streets, to cost approximately $40,000.

The report that the Babcock-Hagmaier Testing Laboratories, Ridge road, Lackawanna, N. Y., has suffered a loss of its plant and laboratory by fire, May 2, is incorrect. The chemical laboratory and office alone were destroyed, and the business is being conducted as usual in the undamaged portion of the factory.

The Walter Bradley Company, Watertown, N. Y., has let the contract for the erection of a pulp mill, storehouse and hydroelectric power plant for the Oswego Falls Pulp & Paper Company, Fulton, N. Y., to cost about $300,000.

Evans & Shann, Middletown, N. Y., have purchased the entire machinery, equipment and patent rights for manufacturing certain mouse traps, and are installing the machinery in a new factory.

Ilion, N. Y., has voted $81,000 of water supply bonds.

It is stated that Walter Pfandler, 71 Pineapple street, Brooklyn, N. Y., has drawn plans for a one-story brick shop to be erected for the E. W. Bliss Company, 11 Adams street, Brooklyn, at an approximate cost of $4000.

Baltimore

BALTIMORE, MD., May 10, 1915.

Although there has been a dearth in applications for the construction of large buildings and factories in and around Baltimore, smaller structures are being erected rapidly. Among these are many good-sized public garages which will be fully equipped.

Isaac E. Emerson plans to erect a public garage at 2502 Eutaw place, Baltimore. Plans prepared by Joseph Evans Sperry, architect, Calvert Building, call for two buildings, one two-story, 24 x 119 ft., and the other one-story, 110 x 119 ft., to cost about $33,000. The construction will be under the supervision of William H. Parker, Baltimore.

Burns & Russell, American Building, Baltimore, have been awarded a contract by the Canton Company, for the erection of a factory at 2339 to 2355 Boston street, for occupancy by W. W. Boyer & Co., 2327 Boston street, canned goods and tin-can manufacturers. The plans call for a four-story brick and concrete structure to cost about $45,000.

Potthast Brothers, 507 North Howard street, Baltimore, plan to install wood-working equipment and motors.

The Skinner Shipbuilding & Drydock Company, Baltimore, is constructing two tank barges for Mexican business of the Huasteca Petroleum Company. It is rushing several other contracts.

Rumor has it that the Pennsylvania Railroad Company plans to construct an elevator on the land occupied by 55 houses on Buren street, Baltimore, which are being razed.

It is reported that a firm manufacturing a credit register on a large scale will locate in Baltimore. It is incorporating now with a capital stock of $300,000 and it is stated that the Corporation Fiduciary Company, Munsey Building, Baltimore, is backing the enterprise.

Fire completely destroyed the plant of the Hock Mfg. Company, Hagerstown, Md., May 7. The damage is said to be between $8000 and $10,000. The foundry was built about two years ago.

William J. Tickner & Son, North and Pennsylvania avenues, Baltimore, will construct a one-story brick garage, 100 x 187 ft. The general contract has been awarded the Consolidated Engineering Company, Calvert Building. It will cost about $10,000.

A report is current that the Bethlehem Steel Company's projectile works, near New Castle, Del., now nearing completion, will be doubled in size.

The Hershey-Sexton Mfg. Company, manufacturer of dish-washing machines, New Britain, Conn., has filed a voluntary petition in bankruptcy in Wilmington, Del.

The City Council, Wilmington, Del., is passing an ordinance permitting the storage of more than 50 lb. of powder within the city limits. The action is taken as an assurance that a time fuse plant is to occupy the old plant of the Standard Arms Company, South Wilmington, Del.

Extensive improvements are being made at the Wilmington Automobile Garage, Wilmington, Del.

A permit has been granted the Wilmington Electro Plating Company, for the construction of a factory at Thirty-first and Market streets, Wilmington, Del., at a cost of $2000.

New England

BOSTON, MASS., May 11, 1915.

Instances are multiplying of manufacturing business improving in other ways than those which can be traced to war orders. The textile people are feeling better, and this is an enormous influence in New England. Larger bank clearings have some significance. Various other straws show the wind to be blowing from a favorable quarter.

In the territory about Bridgeport, Conn., one hears of little else but the new works which will manufacture army rifles. The plant, which has been previously referred to, is being erected by a corporation known as the Bridgeport Arms Company, which is closely affiliated with the Remington Arms Company-Union Metallic Cartridge Company. The officials are not discussing their plans publicly; but the new factories will be large enough to employ nearly if not quite 10,000 men. At least nine buildings will each be about 60 x 300 ft., and five stories. Orders are in hand to keep such a plant busy a long time, producing, it is said, 3000 rifles a day. Much of this is for countries not engaged in war, and the final fulfillment of all contracts is guaranteed by cash deposits already in the hands of New York banking interests. The establishment of works on so large a scale is regarded by other manufacturers of this territory with some trepidation, because of the probable effect in creating a scarcity of good labor. Already an exodus of workmen from Springfield, Mass., to Bridgeport is being arranged, and doubtless other communities will suffer in the same way.

F. E. Seeley has retired as vice-president and assistant treasurer of the Standard Machinery Company, Bridgeport, and for the time being the duties of these offices have been vested in C. E. Bilton, the president and treasurer.

The Waterbury-Farrel Foundry & Machine Company, Waterbury, Conn., is extending its foundry 30 ft., an improvement which the city has made possible by the covering over of a brook in the rear of the property. The company is very busy, the demand for its machinery being large. The shops are operating with full force of men and it is necessary to run until 9 p.m. four nights a week. This condition is typical of all the machine shops of Waterbury. The demand for presses, headers and other machines in which they specialize is enormous. They are sharing with all other New England machinery centers the trouble of a scarcity of skilled labor.

The brass mills of the Naugatuck Valley are exceedingly busy and are operating with two shifts. It is understood that extraordinarily large orders for brass have been placed in the last week or so, which insures the maintenance of the present rate of production, and makes desirable the completion of new manufacturing facilities in process of creation or contemplated.

The Woodward & Powell Planer Company, Worcester, Mass., has returned to its former personnel of management. Several years ago A. M. Powell retired from the business to establish one of his own and since that time has been somewhat closely identified with the plant of the Fitchburg Machine Works, Fitchburg, Mass., where the new Powell planer has been built. This machine will hereafter be a part of the Woodward & Powell line. It possesses several somewhat radical mechanical features, notably an accelerating speed which has found favor abroad as well as in the United States.

The influence of the war orders is shown in the quotations of industrial stocks. Very striking is the case of the Reed-Prentice Company, Worcester, Mass., the common stock of which has advanced 45 points in a few weeks, with the promise of going above the present market. Great orders for engine lathes have put this plant on an extraordinarily profitable basis. Not only is the company operating its own works at maximum capacity, both in machine shops and foundry, but is employing a number of outside plants on a subcontract basis.

The Van Norman Machine Tool Company, Springfield, Mass., manufacturer of grinding and milling machines, will build an addition to its works on Wilbraham avenue, 51 x 88 ft., three stories.

The Rowbottom Machine Company, Waterbury, Conn., will erect an additional building, 40 x 100 ft., one and two stories.

Detroit

DETROIT, MICH., May 10, 1915.

The Hoover Steel Ball Company, Ann Arbor, Mich., is completing its new factory building, 40 x 256 ft., and has already let contracts for the machinery equipment. The new building will increase the output from 4,000,000 to about 7,000,000 balls per day. The factory has been running day and night for approximately the past year, and will continue to do so all summer. L. J. Hoover is vice-president and general manager.

The new engineering building of the University of Detroit, Detroit, Mich., will cost about $230,000, and not $30,000, as has been stated.

The Comstock Automatic Pump Company, Comstock, Mich., recently incorporated, has contracted for the manufacture of its pump for the next year, and does not plan to build any factory at present. E. P. Montague is secretary.

Dowagiac, Mich., has voted $12,000 for purchasing a new engine, electric generator, etc., for re-equipping its electric light plant.

The Spring Lake Ice Plant, Dowagiac, Mich., consisting of main building, engine room, chutes and runways, together with all tools, was destroyed by fire with an estimated loss of about $7000.

Fire completely destroyed the plant of the Michigan Auto Dash Company, Milford, Mich., entailing a loss of between $30,000 and $40,000.

Chicago

CHICAGO, ILL., May 10, 1915.

The Missouri, Oklahoma & Gulf Railway has completed its purchase of tools recently listed, buying, with the exception of a few changes and omissions, all of the equipment indicated in the inquiries. The orders were placed almost entirely in the Chicago market. In connection with other outstanding railroad specifications, no buying action has been taken. The Santa Fe is reported as having purchased a few machines and an inquiry is expected from the Great Northern Railway covering new equipment for an enlarged machine shop in Minnesota. The amount of shopping in this market in connection with war orders continues without perceptible decrease, particularly on the part of Canadian interests. Locally a moderate expansion of manufacturing establishments is noticed; but new equipment buying has hardly been proportionate, during any part of the past year, to increases in floor space. Preparations to erect three new public garages in Chicago are reported; one for A. J. Means, at 1820 West 103d street, to cost $14,000; one for John Fitzpatrick at 4640 North Clark street, to cost $10,000; and one for J. Behrke at Winthrop avenue and Argyle street, to cost $13,000.

The Peerless Piston Ring Mfg. Company, Chicago, has been incorporated with a capital stock of $5000 to manufacture pistons, engine overhauling and general manufacture of machinery. The incorporators are C. M. Hollis, Michael Setter and Willis Melville, 109 North Dearborn street.

The Illinois Tool Works, Chicago, has been organized in the office of Noble B. Judah, Jr., attorney, 134 South LaSalle street, to manufacture machinery, tools and metal specialties. The company has a capital stock of $5000.

The Automobile Engineering Company, Chicago, has been incorporated with a capital stock of $2500 by Charles S. Frank, E. H. Foster and James Fawkner, 209 South LaSalle street. It will manufacture new devices for gas engines and motor cars.

The Watson Solar Window Company, Columbus, Ohio, which has recently moved its business from Chicago, has let contract to the Samuel Austin & Son Company, Cleveland, Ohio, for the construction of its new plant. Archibald Douglas is president, and Henry L. Gogay is vice-president and treasurer.

The Worden-Allen Company, Port Washington road, Milwaukee, has been awarded the general contract for a 100 x 200-ft. rolling-mill addition to the plant of the Mattheissen & Hegeler Zinc Company, LaSalle, Ill., which is to cost about $20,000.

George Gildner, Bloomington, Ill., is taking bids on a garage, 80 x 100 ft., two stories, to cost $30,000. George B. Rhinefrank, 601 Gardner Building, Toledo, Ohio, is the architect.

The Mount Vernon Machine & Motor Company, Mt. Vernon, Ill., has been incorporated with a capital stock of $15,000 by D. P. Settlemire, Logan E. Mayfield and Robert C. Smith.

The Western Seamless Pail Company, St. Charles, Ill., has been incorporated with a capital stock of $10,000 by John J. Andrews, Francis Adams, Jr., and George V. Price.

Henry W. Fritz, city clerk, Staunton, Ill., is receiving bids for the installation of two high-pressure fire-tube boilers.

The Great Northern Railway will build a 60-ft. addition to its machine shops at St. Cloud, Minn., which will make that section of the plant 75 x 260 ft. It is understood that a number of new tools will be purchased.

The Union Sand & Cement Company will erect a $10,000 sand hoisting plant at East St. Louis, Ill.

Watkins, Minn., has voted $10,000 of bonds for a waterworks plant.

The contract for the construction of the new building of the Winona Machine & Foundry Company, Winona, Minn., has been awarded to Weidlitz & Werner, local contractors.

Fire did about $800 worth of damage in the foundry of the Standard Foundry Company, Minneapolis, Minn.

Leigh, Neb., has voted $10,000 of bonds for constructing a municipal electric light plant. Bruce & Standeven, Omaha, are consulting engineers.

Milwaukee

MILWAUKEE, WIS., May 10, 1915.

The manufacture of war munitions is in full swing and furnishing re-employment for a large number of workmen of all classes in the metal trades. Tool builders are maintaining an extended schedule of operations and report a little more domestic inquiry, notably from automobile shops. The employment situation is considered satisfactory, all available skilled help being taken as rapidly as it presents itself. The supply is hardly sufficient. Payrolls show good gains since January 1.

It is expected that work on the new Milwaukee branch plant of the Ford Motor Company will be well under way by May 24. Stakes have been set for a building with ground dimensions of 120 x 300 ft. A. W. L. Gilpin, 143 Eighth street, is Milwaukee manager.

The assets of the defunct Davies Threshing Machine Company, Oshkosh, Wis., have been bid in by Robert W. Mackie at $2700 and if the sale is confirmed, Mr. Mackie, who was president of the bankrupt concern, intends to organize a corporation to continue the manufacture of farm machinery, principally power fertilizer spreaders.

It is unofficially reported that the Aluminum Castings Company, Cleveland, Ohio, will this year make the foundry addition planned more than two years ago at its plant in Manitowoc, Wis., because of the extraordinary demands which extra forces and overtime operations can hardly accommodate.

The Spring City Foundry Company, Waukesha, Wis., manufacturer of gray iron castings, is preparing to make an addition to accommodate the increased demand for gas engine castings resulting from the enlargement of the plant of the Waukesha Motor Company. The foundry was also enlarged last fall.

Schruth Brothers, Pepin, Wis., have broken ground for a garage and machine shop, 30 x 80 ft., of fireproof construction.

The Wisconsin Metal Products Company, Racine, Wis., has been incorporated by J. H. Dwight, Arthur R. Janes and Taylor Jelliffe, with a capital stock of $20,000.

The Dauber-Bell Machine Company, Oshkosh, Wis., has increased its capital from $30,000 to $50,000 to accommodate its growing business.

The Brodhead Latch Company, Brodhead, Wis., light hardware manufacturer, has contracted with the Hibbard, Spencer & Bartlett Company, Chicago, for the distribution of its entire output and expects to increase its production this summer.

Alfred W. Fuchs, 1403 Green Bay avenue, Milwaukee, will erect a concrete garage and repair shop, L-shaped, 20 x 50 and 18 x 35 ft. Leiser & Holst, Germania Building, are the architects.

Milwaukee interests leased the foundry department of the Standard Machine Company, Schleisingerville, Wis., and took possession May 1.

The Schram Mfg. Company, which recently decided to abandon its wood-working plant and furniture factory at Oshkosh, Wis., and relocate at Ladysmith, Wis., has awarded the contract for the erection of the factory to W. E. Bolley, Oshkosh, Wis. It will be of brick, four stories, 60 x 132 ft. H. E. Young, Oshkosh, is president.

R. E. Oberst, architect, 353 National avenue, Milwaukee, is in charge of the construction of a public garage and repair shop on Burnham street, near Twenty-fifth avenue, to be of brick, steel-trussed, 50 x 110 ft., and to cost about $12,000.

The Hartman-Greiling Company, Green Bay, Wis., has undertaken the manufacture of a combination saw tool adapted especially for manual training school work.

Frank and Bernard Lemare, Sturgeon Bay, Wis., are about to open a garage and machine shop in the Falk Building.

The Federal Bridge Company, Waukesha, Wis., denies the report that it is developing a small farm tractor. The report originated from the fact that it has taken contracts to manufacture farm tractors for other companies, and will devote the part of its plant formerly operated as a gray-iron foundry to this work. It is buying a small list of tools.

Articles of incorporation have been filed in behalf of the Demerath Two-Minute Quick Adjustable Rim Company, Milwaukee, to manufacture resilient wheels and wheel rims for automobiles. The capital stock is $25,000 and the incorporators include Joseph B. Demerath, E. M. Sullivan and Theodore Sternemann, all of Milwaukee.

Alex G. Goethel, operating a sheet metal works at 90-92 Second street, Milwaukee, has incorporated the business with a capital stock of $25,000 under the style of Alex G. Goethel Sheet Metal Works. E. G. Keller and F. A. Landeck, attorney, appear as incorporators.

Schmidt & Stork, West Bend, Wis., wagon manufacturers, are in the market for an axle gaining machine, either new or second hand, in good condition.

Cleveland

CLEVELAND, OHIO, May 10, 1915.

Orders for machinery equipment for making war material, mostly shrapnel shells, are coming out in large volume, and inquiries for large number of machines are pending. Of particular interest in this connection is an order placed by the General Electric Company, which is preparing to begin to manufacture 12-in. howitzer shells at its works at Erie, Pa. This company has purchased 30 large projectile boring and turning lathes for making these shells. Considerable machinery is still being purchased in Dayton to make war material recently placed in that city. Canadian machine shops are in the market for a great deal of equipment for the same purpose. Local machinery dealers are getting a very good volume of business, which, for the most part, is coming from manufacturers having war orders. The demand for second-hand machinery is active.

The commissioner of purchases and supplies, Cleveland, will receive bids May 20 for two steam-driven centrifugal feed pumps for the Division avenue pumping station and a cantilever runway for one of the waterworks cribs.

Bids will be taken shortly by the Samuel Austin & Son Company, Cleveland, for the new four-story factory to be erected in Cleveland by the Frantz Premier Mfg. Company.

The Cleveland Railway Company, Cleveland, will expend $500,000 for stations, trackwork, repair shops and barns.

The Zahner Metal Sash & Door Company, Canton, Ohio, will shortly begin the erection of a two-story brick and concrete building which will be used for office purposes, allowing the use of the present office space for manufacturing purposes. In addition to this the company is planning the erection of an additional factory building, 100 x 400 ft. The announcement of the extensions was made at a banquet held May 1, in celebration of the first anniversary of the removal of the company's plant from Kansas City to Canton.

The United Steel Company, Canton, Ohio, has placed an order for a Niles-Bement-Pond 36-in. planing machine with reversing motor.

Bids will be received May 22 for a powerhouse, coal bins, etc., for a heating plant for the Kent Ohio State Normal School. Plans are on file with the architect, George F. Hammond, 4220 Prospect avenue, Cleveland, Ohio.

The Piqua Machine & Boiler Company, Piqua, Ohio, has been incorporated with a capital stock of $10,000. In addition to the machine and boiler repair business, the company will probably add the manufacture of machinery.

The Doehler Die Castings Company, which is building a plant in Toledo, Ohio, will require some machinery equipment when it moves into its new quarters.

The Willys-Overland Automobile Company, Toledo, Ohio, has placed a contract for the erection of a powerhouse.

The Toledo Mfg. & Supply Company, Toledo, Ohio, has been incorporated with a capital stock of $30,000 by Frederick Lang, T. Wooster, C. V. Southard, and others, to manufacture plumbing and gas fitting appliances.

The Fox Furnace Company, Elyria, Ohio, has taken an order for shipment to the European allies for 25,000 portable army camp stoves. It is stated that 100,000 additional stoves will be purchased.

The Fulton Drop Forge Company, Canal Fulton, Ohio, will shortly erect an addition to its plant.

The Mansfield Tire & Rubber Company, Mansfield, Ohio, will shortly begin the erection of a four-story and basement addition to its plant, 41 x 100 ft.

The Biggs Boiler Company, Akron, Ohio, will enlarge its plant by the erection of a one-story brick factory, 30 x 150 ft.

The Summit Welding, Garage & Machine Company, Akron, Ohio, has been incorporated with a capital stock of $10,000 by S. C. Raun, Clarence Becker, and others.

The East Iron & Machinery Company, Lima, Ohio, has acquired a site on which, in a few months, it will erect a plant for the manufacture of asphalt paving plants, in addition to its present lines, which include fabricating structural steel and jail work. The new building will include a main erecting shop 60 x 500 ft., equipped with traveling cranes, powerhouse and other buildings. The company has a capital stock of $125,000, nearly all of which is owned by William East and Charles East.

Cincinnati

CINCINNATI, OHIO, May 10, 1915.

It is rumored that the Indianapolis Division of the Big Four Railroad has a list of machine tools made up; but so far it has not reached the purchasing department. Scattered inquiries have been received from several different railroads, mostly for single tools for replacement purposes. A letup is evident in the demand for lathes; but automatic screw machines are still urgently wanted by a few manufacturers at Dayton, Ohio, who have taken additional orders for war munitions. Quite a number of these machines were purchased lately, and it is understood that Eastern manufacturers took a large part of the business. Builders of radial drilling machines and planing machines are giving out more optimistic reports that are based both on business received lately and that in sight.

Second-hand machinery of all kinds is in good demand, with the possible exception of power plant equipment. The machinery in a large idle plant at Dayton, Ohio, was recently purchased by a Cleveland firm that was able to resell it without removing it from its foundations, although most of it will be shipped away. The boiler and tank business is stationary. Makers of metal-forming machines are very busy and look for an active summer.

It is announced that interests controlling the Cincinnati Milling Machine Company have acquired chief ownership in the joint plant of the Cincinnati Shaper Company and Cincinnati Gear Cutting Machine Company. It is understood that no change will be made in the personnel of either the executive or operating forces of the two companies named.

The R. K. Barlow Company, Cincinnati, is reported to have had plans prepared for a building to be erected at Canal and Race streets which will be used as a garage and automobile repair shop.

Plans are on file in the office of Walter G. Franz, consulting engineer, Union Trust Building, Cincinnati, for the proposed addition to the power plant of Miami University, Oxford, Ohio. Included in the list of equipment wanted are two boilers, a number of pumps and other machinery.

The plant of the Crescent Motor Company, Carthage-Cincinnati, now in the hands of a receiver, has been sold to a syndicate headed by F. B. Enslow, Huntington, W. Va. It is understood the company is to be reorganized and the plant put in operation at an early date.

The Cincinnati Car Company, Winton place, Cincinnati, has lately received a number of car orders, included in which is one for 122 all-steel cars from the Chicago Elevated Railways, Chicago, Ill.

It is reported that the Mosler Safe & Lock Company, Hamilton, Ohio, has let contract for an oxygen gas-generating plant that will be in operation at an early date.

The Dayton Metal Products Company, Dayton, Ohio, whose incorporation was mentioned last week, has leased four floors of the Doty Mfg. Company's building and will

fit up a plant for the manufacture of detonating devices for shrapnel. It is reported that the company recently received a contract aggregating $2,000,000, and also that the devices will be made of steel instead of copper. H. E. Talbott is the head of the new company.

The Platt Iron Works Company, Dayton, Ohio, was the successful bidder on a 3,000,000-gal. high-pressure pump for the Dayton waterworks.

It is reported, but not confirmed, that the Dayton Power & Light Company, Dayton, Ohio, has tentative plans under way for further additions to its power plant equipment.

The Dayton Bag & Burlap Company, Dayton, Ohio, has received a rush foreign order for 500,000 heavy burlap bags. The company will add some special equipment.

The Latty Die & Tool Company, Columbus, Ohio, has increased its capital stock from $10,000 to $20,000, and will add to its manufacturing facilities.

The National Pipe Die Machine Company, Archbold, Ohio, has been incorporated with $10,000 capital stock by John Munroe, George C. Roedel, and others. It will make pipe dies and other mechanical specialties.

An effort is being made to terminate the receivership of the Barney & Smith Car Company, Dayton, Ohio, which bids fair to be successful. A special committee, headed by C. L. Harrison, Cincinnati, is understood to have submitted tentative plans to the directors, and early action is anticipated. The company recently received a large foreign order for special forgings, and in addition its car business is also on the mend. New forging equipment is now being installed.

The Central South

LOUISVILLE, KY., May 10, 1915.

Business is not booming, but machinery dealers are finding trade so much better than it has been that cheerfulness is much in evidence. The boiler trade particularly is improved, and boiler manufacturers have been having a lot of desirable business in manufacturing oil delivery tanks, one company reporting receipts of a carload order from the Southwest. Manufacturing in most lines is opening up, and special machinery is in improved demand for this reason. Crop conditions are good, and winter wheat will probably be above normal. Coupled with improved cotton conditions, this is making for a more optimistic sentiment. A number of small electric light plants are being started in this section, and equipment men are busy figuring on the installations.

The Washburn-Crosby Company, Minneapolis, has let a contract to the Henry Vogt Machine Company, Louisville, for a 600-hp. water-tube boiler for installation in its Louisville mill. The Green Engineering Company, Chicago, was given an order for a chain-grate stoker in connection with the same job.

Henry H. Martin, head of the Henry H. Martin Mfg. Company, Louisville, which operates a foundry, has leased the plant of the New Albany Mfg. Company, New Albany, Ind., and has purchased the stock and materials. The business will be operated hereafter as the New Albany Machine Mfg. Company, and quarrying machinery, which has been the principal line, will continue to be made, while other classes of special equipment will be added.

A manufacturers' bureau of the Louisville Commercial Club has been formed to conduct the permanent manufacturers' exhibit in the Arcadia Building. Among the members are W. Hume Logan, president of the Dow Wire & Iron Works; Theodore Mueller, manager of the Louisville plant of the Standard Sanitary Mfg. Company, and James Clarke, Jr., president of the James Clark, Jr., Electric Company.

J. C. Edwards, Smith Pembroke, Ky., will install an electric light plant and ice factory at Smith's Grove, Ky.

The Robertson County Light & Power Company, Mt. Olivet, Ky., has been organized by W. R. Bethel and Roy Threlkeld, and will put in an electric light plant.

The Carlisle Electric Light & Power Company, Carlisle, Ky., is planning the installation of ice-making equipment.

The Continental Coal Corporation, Pineville, Ky., has let a contract to the South Side Foundry & Machine Works, Charleston, W. Va., for tipple equipment, including cross-over dumps, weigh pans, feeders, shaking screens, etc. A 300-hp. boiler will be installed at a new operation it is to equip.

C. C. Pyles, Ewing, Ky., will establish a feed mill at Dover, Ky. A 10-hp. gasoline engine will furnish the power.

The hemp factory of J. H. Yellman, Lexington, Ky., was damaged by fire May 6 with a loss of $10,000. The principal damage was to the power plant.

Mayor Park, Elizabethtown, Ky., has information regarding the establishment of a tool handle factory.

Samuel Foreman, Paducah, Ky., and others, have formed a company with a capital stock of $100,000, and will build a garage and repair shop.

The Kentucky Block Coal Company, Roanoke, Va., will install an electric power plant and coal mining equipment on an operation near Elkhorn City, Ky.

The automobile repair shop of the Central Motors Company, Owensboro, Ky., was damaged by fire with a loss of $5000.

The T. J. Turley Company, Owensboro, Ky., will distribute the product of the St. Marys Engine Company, St. Marys, Ohio, in Kentucky, Tennessee and southern Indiana.

The Johnson City Lumber & Mfg. Company, Johnson City, Tenn., will equip a 200-hp. steam power plant, and is also in the market for a band saw mill, band ripsaw, circular ripsaws and swing cut-off saws, saw and knife-grinding machinery, hoisting engine, etc. W. S. Smith is superintendent in charge of machinery purchases.

Humboldt, Tenn., plans the installation of an electrically driven centrifugal pump and the reconstruction of its electric distributing system. W. M. Case is manager.

A large sawmill will be erected in Carter county, Tenn., by the Whiting Lumber Company, Philadelphia, Pa., and Asheville, N. C., which recently purchased a large timber tract there. J. M. Lacy, Elizabethtown, Tenn., is in charge of the construction of the plant. A railroad will also be constructed.

The John G. Duncan Company, Knoxville, Tenn., is asking for prices on a 100-hp. double-cylinder double-drum hoisting engine, without boiler.

The Hamilton Motor Car Company, Chattanooga, Tenn., will equip a garage and repair shop. L. T. Prigmore is in charge.

Samuel Leeper, Clarksville, Tenn., has established a machine and automobile repair shop.

The sawmill of Thompson Brothers, Bransford, Tenn., was burned last week. The plant will be rebuilt.

Birmingham

BIRMINGHAM, ALA., May 10, 1915.

New enterprises figure conspicuously in the inquiries being received by the machinery trade, an indication that the financial situation is easier and that the tendency to invest is growing. A slight improvement in the machine-tool demand appeared last week. The lumber interests are taking pumps, engines and boilers in a satisfactory manner. Trade still lags far behind this time last year, but the improvement is a steady one.

Plans have been perfected for the commencement of work on the building of its 13,000-bbl. benzol plant by the Tennessee Coal & Iron Railroad Company at Ensley, Ala.

W. H. Wynn, Dadeville, Ala., contemplates the erection of a box factory.

The Hale Buggy Mfg. Company, Anniston, Ala., has been reorganized with a capital stock of $50,000 by J. A. Evans, J. W. Gresham, W. H. Weatherly, and others. It will operate the plant of the former Hale Buggy Company.

The Dixie Lumber Company, Mobile, Ala., will rebuild at a cost of $10,000 the portion of its plant recently destroyed by fire.

The J. W. McWilliams Lumber Company, Mobile, has been incorporated with a capital stock of $75,000 by J. W. McWilliams, C. A. Slater, E. S. Pearson, and others.

The Clay Products Company, Fairhope, Ala., will be incorporated with a capital stock of $100,000. It plans the development of 300 acres of clay properties, the erection of a sawmill, etc. Plans are under consideration for a dam and the development of 400 hp. F. L. Browne is president.

The Southern Cotton Oil Company, Athens, Ga., will rebuild its oilmill, recently burned.

The board of public works of Plant City, Fla., has plans for the extension of its waterworks system, including a 1,500,000-gal. pump, a 100-hp. boiler, a 200-hp. feeder, etc. The J. B. McCrary Company, Atlanta, has plans and specifications.

St. Louis

ST. LOUIS, MO., May 10, 1915.

The machine-tool market at this point is quiet and dealers are inclined to become somewhat discouraged over the slowness with which local trade is responding to the revival in business, at least so far as new industrial enterprises and expansions of manufacturing are concerned. General business improvement is acknowledged, but new enterprises are not numerous and those under consideration are not coming to a head as rapidly as dealers would like. Money continues easy and low in rate; but caution prevails to an extent that prevents new expansion. Some single-tool inquiries are being received and some sales of like type; but no lists are coming

out. Second-hand tools are somewhat dull. Collections are reported good.

It is announced by John H. Bernhard, New Orleans, La., that a shipyard and machine shop will be established at St. Louis in connection with the plans of the Mississippi Navigation Company, recently financed for $7,500,000.

The city of St. Louis will install an electric light plant at its new Industrial School, the equipment to cost about $3000. The Board of Public Service should be addressed.

The Heil Packing Company, St. Louis, will equip an addition to its packing plant, requiring some additional machinery.

The Ballman-Whitten Mfg. Company, 5407 Easton avenue, St. Louis, Mo., has been organized by Edwin C. Ballman, Stahl A. Whitten and Emil Doerr, to manufacture piston rings and other automobile and engine parts. It has a capital of $10,000.

The Kansas City Radiator Company, Kansas City, Mo., has been incorporated with a capital of $100,000 to manufacture radiators and heating devices. The incorporators are H. F. Hall, G. Rule, L. E. Wyne and T. H. Walker.

The Herff-Brook Motor & Sales Company, St. Joseph, Mo., has been incorporated with a capital stock of $15,000 by C. E. Schwindler, John A. Keller and Howard A. Hall.

The Kansas City Marble & Tile Company, Kansas City, Mo., has been incorporated with a capital stock of $50,000 by Gustav F. Keller, Alfred Guidiol and Henry F. Lansing, Jr., and will install stone-manufacturing equipment.

The Burdette Mfg. Company, 1414 East Ninth street, Kansas City, Mo., will install equipment for manufacturing mops, etc. J. C. Gosnell is president.

The Daughters of Charity of St. Vincent, Normandy, Mo., have had plans drawn by Barnett, Haynes & Barnett, Century Building, St. Louis, for a boiler house, 70 x 100 ft., of reinforced concrete and steel.

Corder, Mo., has voted an appropriation of $6000 to be expended for electric light and power equipment. The mayor is in charge.

J. S. Bowman, Springer, Mo., will equip an electric light and power plant and is reported in the market for generating and power machinery.

Chillicothe, Mo., will build a waterworks plant to cost about $60,000. Harper & Stiles, Kansas City, Mo., are the engineers in charge.

Ashdown, Ark., will install a sanitary sewage disposal system and is in the market for equipment. J. M. Johnson, secretary of the improvement board, should be addressed. A waterworks plant is also to be equipped, including deep well pumps, etc.

Beebe, Ark., will install about $30,000 of waterworks plant equipment under the direction of Albert C. Moore, engineer, Joplin, Mo.

The waterworks commissioners, Paragould, Ark., will expend about $25,000 on additional waterworks plant equipment.

The Standard Brakeshoe & Foundry Company, Pine Bluff, Ark., will equip a plant for the manufacture of brakeshoes, about $40,000 being involved. It has also acquired the Dilley foundry.

The Ark-Ol Products Company, Camden, Ark., will equip a plant for the manufacture of paints, disinfectants, soaps, fire-proofing material, etc. J. W. Crotty, Dallas, Texas, is president and manager.

The Capital City Water Company, Little Rock, Ark., has been incorporated with a capital stock of $100,000 by C. J. Eld, J. Merrick Moore, G. M. Gadsby, and others, to install equipment to supply water to suburban districts near Little Rock.

The Acme Cooperage Company, Jacksonport, Ark., has been incorporated with a capital stock of $12,000 by N. B., W. V. and V. L. Turner.

The Farmers' & Merchants' Gin Company, Maysville, Ark., has been incorporated with a capital stock of $15,000 by R. J. Wigley, W. E. Bailey and J. R. Hamm.

The Adamson Light & Power Company, Adamson, Okla., has been incorporated with a capital stock of $15,000 by James R. Williams, Gerald Riedt, and others.

The Hugo Ice & Light Company, Hugo, Okla., will expend $30,000 in the extension of its plant and adding to its generating equipment, including one 500-kw. mixed pressure turbo generator, one 400-hp. boiler, etc.

The Henryetta Ice & Cold Storage Company, Henryetta, Okla., has been incorporated with a capital stock of $80,000 by B. T. Lilly, George W. McFann and W. H. Irwin and will engage in the ice manufacturing business.

Morris Sass, Ardmore, Okla., will install equipment including a gasoline engine power plant.

The Federal Motor Company, Tulsa, Okla., has been incorporated with a capital stock of $13,000 by H. H. Gries, E. A. Ross and W. H. Hendee, Pocasset, Okla.

Drumright, Okla., has formally authorized the expenditure of $35,000 for addition to the waterworks equipment.

The Natchez Oil Mill, Natchez, Miss., has been incorporated with a capital stock of $75,000 by H. M. Alexander, Charles F. Engle, W. B. Mangum, and others, and will install oil-mill equipment.

The Shepard-Jenkins Lumber Company, Estill, Miss., has been incorporated with a capital stock of $15,000 by John J. Shepard, Burton W. Jenkins, Estill, and H. A. Hoover, Chicago, Ill. It will install mill equipment at once.

The Tylertown Box & Mfg. Company, Tylertown, Miss., will equip a plant for the manufacture of a vegetable container for shipping purposes. Wood-working machinery and power equipment will be installed.

The Planters Oil Mill & Gin Company, Kosciusko, Miss., is in the market for additional power equipment, boilers, etc.

The New Orleans Railway, Light & Power Company, New Orleans, La., will expend about $125,000 on equipment for its power plant, which is to be enlarged.

The Jennings Electric Company, Jennings, La., has been incorporated with a capital stock of $15,000 by Robert B. Montgomery, D. Gaylord Powell and Harry A. Kolb.

The Dock Board, New Orleans, La., with Bacon, Ford & Davis, 115 Broadway, New York, engineers in charge, will build a grain elevator with a capacity of 1,000,000 bu.

The Gulf Compress Company, Tupelo, Miss., will rebuild the portion of its plant, recently burned.

Texas

AUSTIN, TEXAS, May 8, 1915.

The demand for heavy machinery is unusually good. Much activity in promoting the building of new manufacturing plants is reported. Machinery and equipment for boring oil wells in the new Thrall field and adjacent territory are in great demand. Scores of companies have already been organized to carry on development operations of that character.

The Abilene Gas & Electric Company, a subsidiary of the American Public Service Company, will enlarge its central power plant at Abilene by installing additional machinery and equipment. It will also double the capacity of its ice manufacturing plant and enlarge the cold storage plant. G. H. Caffrey is manager.

The local waterworks plant at Phoenix, Ariz., will be equipped with three electrically driven pumps, each of a capacity of 2500 gal. a min.

The Ammons' Automatic Fire Alarm System of Texas, Houston, has been organized with a capital stock of $100,000. J. B. Ammons is one of the incorporators.

The Non-Adjustable Engine Company, Crosbyton, which was recently organized with a capital stock of $50,000, will manufacture engines. W. J. Williams is one of the principal stockholders.

The Houston, Richmond & Western Traction Company, Houston, has been organized with a capital stock of $50,000 to construct an interurban electric railway between Houston and Richmond. Edward Kenedy, W. W. Thomas and J. C. Eganhouse are the incorporators. The building of an electric powerhouse is involved in the plans.

The Texas Refining Company, Greenville, has broken ground for a cotton-seed oil mill.

L. B. Myers, El Reno, Okla., and associates, will construct a combined electric light and power plant and ice factory at North Pleasanton, Texas, at a cost of about $40,000.

J. H. Caswell, San Diego, Cal., and associates, are arranging to build a system of interurban electric railways in the Corpus Christi section. The erection of an electric power plant is planned.

Bonds in the sum of $40,000 have been voted at Victoria for constructing a municipal electric light plant.

Frank Goering, Temple, plans to build a factory for the manufacture of sheet-iron beds for automobiles.

The Southland Oil Company, Temple, will add to the equipment and make improvements to its cotton-seed oil mill.

The Holts Heights Water Company will build a new pumping plant at Honey Grove.

The Rio Grande Dam, Light & Power Company, Philadelphia, Pa., has made application to the state engineer of New Mexico for permission to construct a dam 100 ft. high in White Rock Canyon, near Buckham, N. M., and to use a part of the flow of the Rio Grande River for developing power for industrial purposes. It is planned to build a hydroelectric plant and to supply power to Albuquerque, Santa Fé, Las Vegas and to other cities in New Mexico, and to irrigation pumping plants in the Estancia Valley.

The Pacific Northwest

SEATTLE, WASH., May 4, 1915.

New inquiries are received daily from Alaska, Oregon, eastern Washington and Idaho for mining machinery of all kinds. The unusual demand for metals in Europe has caused an early re-opening of practically all smelters in the Northwest. The lumber industry remains quiet, although several inquiries for large shipments to Europe have been filed with Seattle and Portland lumbermen. Nothing definite can be obtained from this source at present.

The Seattle Port Commission has approved the recommendation of its chief engineer to purchase equipment and machinery for the transfer and handling of grain at the Port Commission's warehouse on Hanford street. It is estimated this installation will cost approximately $5000, and bids will be received soon. A portable crane will be installed. Plans for refrigerating and cooling machinery, to be installed at the warehouse, will be immediately prepared by the chief engineer. This work will cost about $100,000, and plans will be ready for bids in about two weeks.

The Weyerhauser Timber Company, Everett, Wash., has voted to construct a large addition to its electrically driven sawmill now nearing completion in Everett. John P. Weyerhauser, Spokane, is president.

The H. H. Franklin Mfg. Company, Billings, Mont., will construct a three-story addition to its plant at a cost of $25,000. Plans have been prepared by Gordon Wright.

Raymond, Wash., has sold $117,000 of bonds to be used to purchase the local water system and make necessary improvements.

The Stella Lumber Company, Stella, Wash., has been incorporated by C. F. Struckmeier, M. Struckmeier and H. A. Smathers with a capital stock of $20,000. It is stated the company will erect a lumber mill.

The Western Sash & Door Company, 1112 Hawthorne street, Portland, Ore., has been given permit to construct a two-story factory on East Fiftieth between Sherman and Caruthers streets.

The Klamath Mfg. Company, Klamath Falls, Ore., will double its annual output. The increase is the result of securing contracts for lumber and box shooks for the Orr Lake Lumber Company, Bray, Cal., whose plant was recently destroyed by fire. The Orr Company, in rebuilding its plant, will not equip it to care for this line of work, but turn it over to the Klamath Company. New equipment will be required.

The Keystone Mining Company, Wallace, Idaho, has started improvements which will involve the expenditure of more than $150,000, including the construction of an hydroelectric light and power plant. Volney D. Williamson, Spokane, is president.

Plans for the six-story concrete warehouse and factory to be built by the Doernbecher Mfg. Company, Portland, have been completed by Jacobberger & Smith, architects, and work will begin at once. The building will be 100 x 150 ft., and will cost approximately $50,000.

The plant of Albers Brothers' Milling Company, Portland, Ore., was damaged by fire recently, with a loss of about $140,000.

The Consolidated Wagon & Machine Company, Twin Falls, Idaho, are having plans prepared for a factory to be 100 x 115 ft., of brick and iron construction. The latest type of equipment will be installed.

The Billings Foundry & Mfg. Company, Billings, Mont., has elected I. D. O'Donnell, president, and C. H. Smaiz, secretary and treasurer. It is capitalized at $100,000, and plans to enlarge its factory immediately, including the installation of special equipment to manufacture structural steel, general supplies and reinforcing material.

A small factory will be built by C. L. Camp, Cleveland avenue, Spokane, Wash., to manufacture a patented suspender device.

Timber, estimated at 30,000,000 ft., has been purchased by N. Brown, Orofino, Idaho, agent for John W. Mariner, Milwaukee, Wis. In addition approximately 40,000,000 ft. near that property has been purchased, and the new owner will erect a sawmill at Weippe, Idaho, to work up the lumber.

Bids for the following electrical equipment will be received until May 28 by R. W. Davis, mayor, Harrisburg, Ore.: One 35-hp. motor of 900 to 1300 r.p.m.; one 25-hp. motor of 900 to 1200 r.p.m.; one 5 hp. motor of about 1500 r.p.m.

It is reported that the Portland Cement Company, Dallas, Ore., will immediately complete its cement manufacturing plant at Oswego, Ore., financial arrangements having been made. The buildings are almost ready for the installation of machinery, and the company plans to obtain bids on equipment in the near future.

The West Virginia Mining Company, Republic, Wash., has plans completed for installing a 200-hp. compressor, a large Diesel type engine and an electric hoist.

The Westerman Iron Works, Seattle, Wash., on a bid of $7,100, received contract for furnishing the Seattle Port Commission with a shear leg derrick to be installed at its fruit storage building.

Powell, Mont., will select an engineer to prepare plans for the water system, for which $61,500 of bonds was recently sold.

An ice-making plant will be built by M. Fish and R. N. Hitchcock, Helena, Mont. Plans are now ready and a site has been secured.

The Evergreen Lumber Company, Aberdeen, Wash., has increased its stock to $250,000, and is understood to plan alterations to its plant.

A wooden box factory will be built in Seattle, Wash., by W. S. Cram and G. W. Cheney, both of Redmond, Wash. A site has been secured and construction will begin this summer.

San Francisco

SAN FRANCISCO, CAL., May 4, 1915.

Machine-tool sales continue light; but numerous inquiries are coming out, which are expected to result in a fairly active business by next fall. A few sales of some importance are being closed now; but most orders are of a small nature, although the number is increasing. Implement manufacturers are especially busy, and show an increasing disposition to increase their facilities. The demand for miscellaneous machinery shows a steady improvement. More activity in public work is evident, and development projects of various kinds are finding stronger support than for some time past.

The Doane Motor Truck Company, San Francisco, is starting a shop in this city for the manufacture of motor trucks, and has placed an order for general shop equipment, including a Springfield 16-in. back-geared crank shaper, with Fred Ward & Son.

The Holt Mfg. Company, Stockton, Cal., is making extensive improvements in its machine shop and harvester department.

The Southern California Iron & Steel Corporation, which recently succeeded the California Industrial Company, Los Angeles, has started up an oil-burning open-hearth furnace, with a capacity of 1500 tons per month. It will roll open-hearth bars, and the output will be largely used in its bolt department. A 40-ton ladle crane has been installed in connection with the new furnace.

The city of Sacramento has ordered several tools for the municipal machine shop, including a 20-in. x 10-ft. lathe, a 24-in. drill, a 24-in. shaper, and a 12-in. grinder.

Lakeview No. 2 Oil Company, Maricopa, Cal., is building a boiler house to house five 70-hp. boilers. A new engine and a machine shop will also be installed.

C. H. Drewery, Ukiah, Cal., was recently in San Francisco to buy tools for an automobile shop.

The Healdsburg Ice & Cold Storage Company, Healdsburg, Cal., is putting in an ice-making plant.

The city of San Francisco has placed an order with the Eby Machinery Company for a small sawmill outfit for the Hetch Hetchy water project.

J. C. Phelan, Fresno, Cal., is building a garage and machine shop.

Escondido, Cal., is taking bids for two waterworks pumping plants.

The Western Fuel Company is building a large coal bunker at the foot of Market street, Oakland. It will be fully equipped for loading and unloading vessels.

Bids will be taken this week for a motor generator set for the Potrero municipal car barn, San Francisco.

The Automatic Gang Drill Machine Company, Los Angeles, has been incorporated with a capital stock of $20,000, by H. F. Stewart, V. H. Rossetti, I. Silver and G. S. Uman.

It is reported that L. M. Hall, Virginia City, Nev., has plans for the construction of a 1500-hp. hydroelectric plant on the south fork of Humboldt River, Nevada.

The Engineering & Foundry Company, Stockton, Cal., has been incorporated with a capital stock of $100,000 by J. W. Hannah, L. L. Miller, M. Davidson, C. L. Best and L. Grimsley. Mr. Hannah was formerly sales manager for the Harris Harvester Works; Mr. Miller was with the Holt Mfg. Company; Mr. Davidson is a scrap dealer, and Mr. Grimsley has been associated with the Best Mfg. Company, San Leandro.

Eastern Canada

TORONTO, ONT., May 10, 1915.

Slough & Bush, St. Paul street, St. Catharines, Ont., are to convert their garage into a factory for the manufacture of shrapnel shells.

Steel & Radiation, Ltd., Toronto, is to double its capacity for the manufacture of shrapnel shells. It is at present turning out 100 shells a day. Henry Pellatt is president.

The Nova Scotia Steel Company, Ltd., New Glasgow, N. S., has received an additional order to the value of $3,500,000 for shells for the British Government. New machinery will be required. Thomas Cantlie is general manager.

The Record Foundry Company, Moncton, N. B., is to install machinery at an estimated cost of $40,000 for the manufacture of high explosive projectiles. A gasoline engine of 180 hp. is also to be installed.

The Utilities Commission, Peterboro, Ont., has instructed William Kennedy, Jr., Montreal, to prepare plans for an auxiliary pumping plant with a capacity of 4,000,000 gal. a day.

A charter has been granted Peau Lacoste, Alexandre Lacoste, Jules A. Mathieu, Joseph H. Gerin-Lajoie and Joseph E. Cote, all of Montreal, to manufacture shells, bombs, cartridges and articles of iron and steel under the style of St. Lawrence Engineering Company, Ltd. The capital is $72,000 and the head office is at Montreal.

Having received a large order for shells the Canadian Locomotive Company, Kingston, Ont., will increase its working staff and equipment.

The Dominion Canners, Ltd., Hamilton, Ont., will erect a factory at Chatham, Ont.

The 500,000 bu. elevator of the National Elevator Company, Port Arthur, Ont., has been destroyed by fire with a loss of $100,000.

The Ker & Goodwin Machine Company, Ltd., Brantford, Ont., has been incorporated with a capital stock of $50,000 to manufacture articles of metal and wood, machinery and machine shop supplies. The incorporators are Willoughby S. Brewster and George H. Heyd, both of Brantford.

The Boston, Montreal & Quebec Timber Company, Ltd., Montreal, has been incorporated with a capital stock of $50,000 to operate sawmills. Oscar F. Berthiaume, Charles A. Springings and Joseph H. Poulin, all of Montreal, are the incorporators.

The Church, Ross Company, Ltd., Montreal, has been incorporated to carry on an engineering and contracting business with a capital stock of $50,000. The incorporators are Kenneth D. Church, Donald W. Ross, E. M. Wilson and J. W. Ross, all of Westmount, Que., and Edgar Wells, Lachine, Que.

A company with a capital stock of $500,000 has been incorporated under the style of the Pidgeon River Lumber Company, Ltd., to conduct planing and lumber mills. The head office is at Port Arthur, Ont., and William Scott, Daniel W. Chamberlain, both of Port Arthur; Frederick Babe and Frederick R. Morris, both of Ft. William, Ont., are the incorporators.

Woodworth Brothers, Berwick, N. S., are in the market for equipment for a flour mill which they are erecting at that place.

A. Gordon is promoting a syndicate to start a beet sugar refinery at Aylmer, Que.

Preston, Ont., has decided to grant the Henry Mountain Mfg. Company a bonus of $21,500 for the establishment of a branch factory.

The Canada Woodenware Company, Ltd., Toronto, has been incorporated with capital stock of $40,000 by Abraham Ball, Austin F. Haviland and Frederick W. Chapman.

Plans are being prepared for an elevator of 500,000 bu. capacity to be erected at Owen Sound. J. H. Tromanhauser & Co., Temple Building, Toronto, are in charge.

J. Brunet, Ltd., Montreal, has been incorporated with a capital stock of $100,000 to manufacture bricks, concrete, etc. Louis A. Rivet, Louis G. Glass, Albert Papineau and George Duclos are the incorporators.

Arthur W. P. Buchanan, John H. Turner and George R. Drennan, all of Montreal, have been incorporated with a capital stock of $50,000 under the style of the Armstrong Cork & Insulation Company, Ltd., to manufacture cork products, insulating and refrigerating machinery.

The plans for the Lemieux Island overland pipe project for supplying Ottawa, Ont., with water for fire protection, call for high-lift pumps affording a pressure of 120 lb. John B. McRae, Ottawa, is consulting engineer.

The design of the plant which the Rideau Power Company, Merrickville, Ont., is constructing to supply power for surrounding factories, calls for two units of 562 kw. capacity.

Bracebridge, Ont., will expend $12,000 on a waterworks extension. A. C. Salmon is town clerk.

Hamilton, Ont., proposes to expend $200,000 for hydroelectric purposes. S. H. Kent is clerk.

The Standard Chemical Company, Sault Ste. Marie, Ont., is making extensions to its plant at an estimated cost of $100,000.

F. W. Harrison and P. S. Patterson, Owen Sound, Ont., will erect a factory for the manufacture of wheels for automobiles, motor trucks, etc.

Thomas A. Beament and Alan H. Haskett, both of Ottawa, have incorporated the White Marble Company, Ltd., Ottawa, with a capital stock of $150,000, to quarry marble and manufacture cement.

J. S. Hughes, Mill Village, N. S., has secured a site at Selkirk, Man., for the erection of a paper mill, to cost $150,000.

The City Council, Hamilton, Ont., has appropriated $47,500 for the completion of sewage disposal works at the asylum.

Western Canada

WINNIPEG, MAN., May 8, 1915.

Manufacturing industries in western Canada are less active than the normal of the last few corresponding seasons; but the situation seems to have brightened up in the last week or two. Machinery firms say that orders for machinery parts and various kinds of tools are more numerous than previously, and the outlook is considered encouraging. Some lumber mills which recently started operations in the interior of western Canada are fairly good buyers of different articles, but no individual large orders are reported. It is expected that a moderately active call for grain elevator machinery will appear this summer. Several elevators burned since the first of the year, and practically all of these will be replaced.

The elevator of the National Elevator Company, Ltd., Port Arthur, Ont., burned a few days ago with a loss of about $50,000 on the building. It is expected that the plant will be rebuilt at once, to be ready for the next crop. It had a capacity of 65,000 bu.

It is announced that the Ford Motor Company of Canada, Ford, Ont., will build a large assembling plant in Winnipeg this summer. Gordon M. McGregor, general manager, has been in Winnipeg making arrangements. He said the plant would probably cost about $250,000.

Plans for repairs and additions to the Kamloops, B. C., municipal power plant are being prepared by DuCane, Dutcher & Co., 470 Granville street, Vancouver, B. C., at an estimated cost of $50,000.

W. M. Scott, engineer, 204 Sterling Bank Building, Winnipeg, Man., is calling for tenders for the supply and erection of pumping machinery, including electrical equipment for Transcona, Man.

Revelstoke, B. C., has let a contract to G. D. Shaw of that town for the erection of a power-house.

The Imperial Oil Company, Ltd., Prince Rupert, B. C., is constructing storage tanks, and will install operating engines and other equipment.

Kamloops B. C., has passed by-laws to spend $85,000 to complete its hydroelectric system.

The Theodore Kipp Company, Ltd., Winnipeg, has been incorporated with a capital stock of $40,000 to do a general engineering business.

Government Purchases

WASHINGTON, D. C., May 10, 1915.

The chief of the Bureau of Yards and Docks, Navy Department, Washington, will receive bids until 11 a.m., June 12, for shipbuilding cranes for the Navy Yard, Norfolk, Va.

Bids will be received by Major T. H. Jackson, United States Engineer Office, Wheeling, W. Va., until 11 a.m., June 2, for furnishing and delivering water turbines, air compressors, valve jacks, gate winches, etc., for dams Nos. 15 and 19, Ohio River.

Bids will be opened May 20, by the purchasing officer, Panama Canal, Washington, under canal circular 923, class 5, for two centrifugal sewage pumps of 350 gal. per min. capacity, and one centrifugal fire pump of 700 gal. per min. capacity; until 10:30 a.m., May 27, canal circular 924, for an ice and refrigerating plant, motor driven lathes, drill presses, shaping machines, and sensitive drills.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, June 1, schedule 8273, for eight spur-geared hoists and one engine lathe; and schedule 8277 for one cutting-off machine, all for Washington; schedule 8270, one radial drill for Mare Island.

Trade Publications

Machine Work.—Modern Machinery Company, Wilmington, Del. Folder. Refers to the work which this company is prepared to do as a contracting machinist in supplying jigs, fixtures, machine parts and complete machines. Mention is also made of the line of malleable, gray-iron, bronze, brass and aluminum castings that can be supplied, as well as hammer and drop forgings and cast-iron and steel gears. Illustrations of castings and typical parts are included.

Nut Tapping Machine.—National Machinery Company, Tiffin, Ohio. Circular. Calls attention to a new nut tapping machine, which is built in sizes ranging from ¼ to ¾ in. An illustrated description of the machine appeared in *The Iron Age*, January 28, 1915.

Molding Machinery.—Henry E. Pridmore, Nineteenth and Rockwell streets, Chicago, Ill. Catalogue No. 8 and four folders. The first emphasizes the necessity for molding machinery in foundries and the wide application of this line. The several types of stripping plate machinery are taken up including square and round single and double shaft machines, as well as special oil box, transformer box, pivot draw, single and double stand rock-over, power ramming, hand and power squeezer and motor-driven jar ramming machines. Each type is illustrated and a general description given. Recommendations of equipment for specific purposes are made. An extended discussion of the installation of patterns in and the operation of stripping plate machines is included. The folders take up single types of the machines described in the large catalogue.

Nozzles and Deluge Sets.—Samuel Eastman Company, Concord, N. H. Catalogue and folders. The catalogue explains the principle of these nozzles which are claimed to be more efficient than wagon or turret nozzles, giving illustrations of this equipment in operation. The folders are given over to testimonials.

Rubber Stamps.—James H. Matthews & Co., Pittsburgh, Pa. Catalogue No. 80. Shows the latest faces of rubber stamp type from the smallest size up to the largest. Illustrations of type borders for rubber stamps are also presented.

Punching, Shearing and Bending Machines.—J. F. Kidder Mfg. Company, Burlington, Vt. Pamphlet. Refers to a line of punching, shearing and bending machines designed for hand power operation on benches. In addition to the separate machines for these operations, one is illustrated and described that will punch, shear and bend without any readjustment. In the pamphlet a separate page is devoted to each machine, as a rule, with an engraving and brief description. Mention is also made of a machine for bending hooks and eyes from band iron.

Steel Plant Equipment.—Deutsche Machinenfabrik-A.-G., Duisburg, Germany, Neumeyer & Dimond, 82 Beaver street, New York City, American agents. Catalogue. Size, 8¾ x 11¼ in.; pages, 216. Gives illustrations and descriptions of the machinery and equipment required for steel plants from large pieces of apparatus, such as mixers, furnaces, converters and the necessary driving equipment down to cranes and traveling hoists of simple type. The book shows the development of the basic and open-hearth plants by including a number of views of older installations and is divided into two sections which deal with each of the two types of plates. The apparatus used is arranged in each section in the same order that the steel is manufactured, from the blast furnace in one case and the scrap yard in the other, to the rolling mill in both. An alphabetical list of the equipment described occupies four pages of the catalogue, and mention is also made of other work which the company is prepared to execute, such as equipment for mines and quarries, blast furnaces, rolling mills, shipyards, cargo handling machinery and power houses.

Drop Forgings.—Lakeside Forge Company, Erie, Pa. Catalogue O. Covers an extensive line of drop forged wrenches with double and single heads for a variety of purposes, adjustable wrenches, eyebolts, gas engine cranks and straps for agricultural machinery. Tables show the sizes and prices of each type of product. Included is a brief description of the facilities of the factory and an explanation of the special drop forging work, which can be supplied to order.

Motor Trucks.—United States Motor Truck Company, Cincinnati, Ohio. Folder. Gives brief descriptions of different styles of motor trucks that are built in sizes ranging from 2 to 4 tons. Mention is made of the uniform construction of the different sizes of trucks and the fact that many parts of the different sizes are interchangeable. The bodies are built to suit the requirements of the user.

Gears.—Grant Gear Works, 151 Pearl street, Boston, Mass. Catalogue and price list. Contains information and prices on cut and cast brass and iron gears of various types and for a variety of uses, as well as racks, ratchets, sprockets and chain, malleable iron chains, etc. Mention is made of the company's facilities for special work. Hints on computing sizes of spur and bevel gears are included.

Grinding and Polishing Machinery and Supplies.—L. Best Company, 75 Barclay street, New York City. Catalogue. Deals with various types of grinding, polishing and buffing machinery and supplies, which include wood polishing and emery wheels, brushes, buffs, countershafts, emery wheel dressers, diamond tools, knife and tool grinding machines and belts. Types of these machines are illustrated and briefly described with condensed specification tables and in the case of emery wheels, views are given showing the shapes in which these can be supplied. Directions for ordering and using emery wheels and a grading list are included.

Gas Engines and Flexible Couplings.—Bruce-Macbeth Engine Company, Cleveland, Ohio. Two circulars. The first calls attention to the company's vertical multi-cylinder gas engines, briefly outlining important features of their construction and giving a list of installations. The second deals with a flexible coupling designed for direct connecting engines and generators and permitting members to be mounted on separate bases.

Sprockets.—Cullman Wheel Company, 1344 Altgeld street, Chicago, Ill. Catalogue No. 10. Describes and illustrates a large line of sprockets for use with standard block, roller and high-speed chains on pleasure cars or motor trucks and general machinery. Special emphasis is given to differential gears and the care of sprockets and chains. Tables of approximate horsepower for the various chains and speeds are included.

Electric Motors.—Electro-Dynamic Copmany, Bayonne, N. J. Five bulletins and instruction book. The first, No. 36, illustrates and describes the interpole motor which was illustrated in *The Iron Age*, February 2, 1905. The special features of these motors are discussed, the various sizes and styles are shown and a number of test curves are included. No. 37 covers the subject of motor drive and shows a number of installations of the motor for driving machine tools. No. 42 takes up the inclosed type S motor for use where dust or moisture might interfere with its work. No. 43 discusses the motors for driving printing presses and shows installations for this work. No. 45, superseding No. 39, contains data on the ratings and dimensions of the type S motor for various speed ratios of both open and closed adjustable-speed motors, also those operating at a constant speed. The instruction book includes a general discussion of the construction and operation of these motors.

Steel Shafting.—Cumberland Steel Company, Cumberland, Md. Price list P. Quotes prices on turned and ground steel shafting in stock sizes, cold rolled steel squares, flats and hexagons, standard keyseated shafting and flange couplings.

Locomotive Cranes.—Ohio Locomotive Crane Company, Bucyrus, Ohio. Catalogue. Size, 8 x 10½ in.; pages, 56. Describes and illustrates types of four and eight wheel steel locomotive cranes from 5 to 50 tons capacity which can be supplied for track of any gauge, showing details of construction and method of operation. Tables and diagrams showing the radius of rotation of the several sizes, a partial list of users and many illustrations of the machines in operation are included.

Tool Steel.—Midvale Steel Company, Philadelphia, Pa. Three circulars. Two present the qualities of two brands of tool steel adapted for the manufacture of dies, taps, cutting tools, reamers, slotters, shapers, etc. Instructions on heat treating are included. The third takes up Steelite, a brittle alloy suitable for use in tools which can be supported close to the cutting edge.

Pipe Supplies.—Grabler Mfg. Company, Cleveland, Ohio. Price list. Size, 5½ x 8 in.; pages, 167. Illustrates and describes an extensive line of single and multiple pipe and roller hangers, pipe and I-beam clamps, lag screws, floor and ceiling plates, unions and couplings, cross-overs, washers, nuts, turnbuckles, machine bolts, ladders, etc.

Inspection Cars.—Light Inspection Car Company, Hagerstown, Ind. Catalogue 18. Illustrates one, two and three passenger footpower cars for use on various gauges of track.

Drill Chucks and Standard Gauges.—Gronkvist Drill Chuck Company, 18 Morris street, Jersey City, N. J. Two booklets. The first illustrates and describes a line of quick-acting, high-speed, keyless drill chucks, a feature of which is that they permit the operator to remove the drill without stopping the machine. The second describes the character and uses of standard gauges which are guaranteed accurate to 0.00001 in., adjustable limit snap and tolerance plug gauges. The measuring plugs of the snap gauges are not threaded but are plain cylinders of hardened steel which are prevented from turning when adjustments are being made by a clamping screw. All types are illustrated.